STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

EDITORIAL STAFF

E. L. SHANER, *Editor*
E. C. BARRINGER, *Managing Editor*
E. C. KREUTZBERG, *Engineering Editor*

ASSOCIATE EDITORS

A. J. HAIN — E. F. ROSS
G. H. MANLOVE — J. D. KNOX
A. H. ALLEN

New York B. K. PRICE—L. E. BROWNE
Pittsburgh . . . E. A. FRANCE JR.
Chicago . . . . . W. G. GUDE
Washington . . . . . L. M. LAMM
London . . . . VINCENT DELPORT

Published by
PENTON PUBLISHING CO.
PENTON BUILDING
CLEVELAND, O.

JOHN A. PENTON, *Chairman of Board*
C. J. STARK . . . . . *President*
J. D. PEASE . . . *Vice President*
F. V. COLE . . . . . *Secretary*

BUSINESS STAFF

GEORGE O. HAYS, *Business Manager*

New York
J. F. AHRENS — E. W. KREUTZBERG
Pittsburgh . . . . S. H. JASPER
Chicago . . . . . L. C. PELOTT

Cleveland
JOHN HENRY — R. C. JAENKE

R. T. MASON, *Circulation Manager*

Contents . . March 25, 1935

Volume 96 ◆ Number 12

AS THE EDITOR VIEWS THE NEWS 9

Witherow on NIRB; Steel Founders Back NRA 10

Basing Point Issue Quiets Down 11

Republic Merger Urged as Benefit to Industry 12

War Unbalances Steel Trend Lines 13

Institute Rips Wagner Labor Bill 14

NEWS OF THE WEEK:

Production	14	Foreign Trade	18
NRA	18	Financial	20
New Capacity	18	Users', Makers' Activities	22
Steel in the News	18	Institute	74

Mirrors of Motordom 15

Windows of Washington 17

Industrial Men in the Day's News..... 19

Obituaries 20-75

30,000,000 Tons, Iron Ore Aim This Year 21

EDITORIAL—NIRA Extension Rests with Industry.... 23

THE BUSINESS TREND..... 24

ENGINEERING DEVELOPMENTS:

All-Steel Gas Range—I.....	26	Progress in Steelmaking.....	41
Making Knee-Action Units	30	Control of FeO in Slags.....	43
Methods and Materials	34	Chicago Foundry Meeting.....	46
New Bearing Alloys.....	34	Incentives or Day Work?	47
Drafting Tables	38	New Equipment	49
Dispatch Boats Welded.....	40	Trade Publications	54

MARKET REPORTS AND PRICES.....55--75

CONSTRUCTION AND ENTERPRISE.. 76

ADVERTISERS' INDEX..... 82

BRANCH OFFICES:

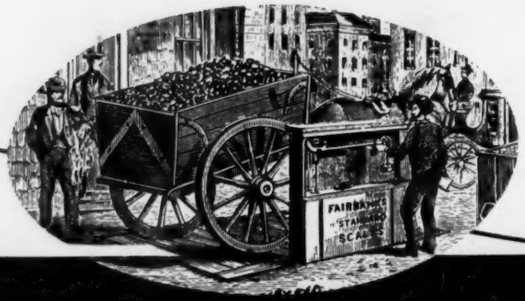
New York . . . . . 220 Broadway
Chicago . . . . Peoples Gas Building
Pittsburgh . . . . . Oliver Building
San Francisco . . . . 2413 Milvia St. Berkeley, Calif., Tel. Berkeley 7354W
Washington . . . National Press Building
Cincinnati . . . 418-420 Sinton Hotel
London . . . . . Caxton House Westminster, S. W. 1
Berlin . . Berlin, N. W. 40, Roonstrasse 10

Member Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers Association.

Published every Monday. Subscription in the United States, Cuba and Mexico, one year $4, two years $6; in Canada, one year $6.60, two years $11.20; in Great Britain and European countries, one year £2.

Entered as second class matter at postoffice at Cleveland under the Act of March 3, 1879.

Copyright 1935 by Penton Publishing Co.



It took a hundred years of scale development to give you

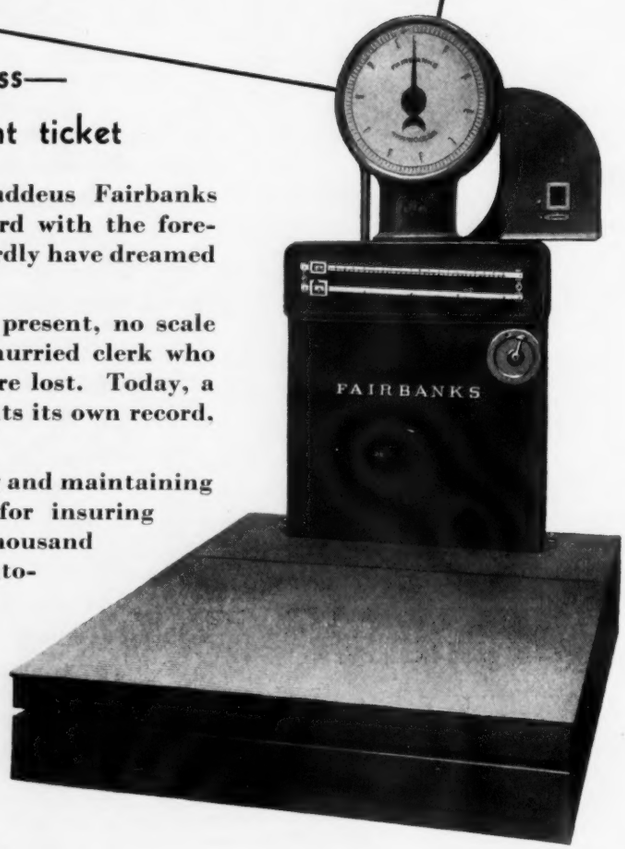
A *Printed Record* OF WEIGHTS

A century of progress— steelyard to printed weight ticket

● When, well over a century ago, Thaddeus Fairbanks supplanted the age-old Roman steelyard with the forerunner of the modern scale, he could hardly have dreamed of today's scale accomplishments.

In those days, and even well into the present, no scale was more accurate than the tired or hurried clerk who read it. Errors were made. Profits were lost. Today, a Fairbanks Dial Scale automatically prints its own record, free from human error.

For accurate cost accounting, for setting and maintaining payment of men on tonnage basis, for insuring control of raw materials and for a thousand other uses in industry, Fairbanks automatic weight recording scales are guarding profits. They are simple in design, automatic in action and incorporate true Fairbanks precision. For complete information, write Fairbanks, Morse & Co., 900 South Wabash Avenue, Chicago, Illinois. And 40 principal cities—a service station at each house.



Fairbanks Scales

PREFERRED THE WORLD OVER

6293-SA 40.14

STEEL
PRODUCTION • PROCESSING • DISTRIBUTION • USE

As the Editor Views the News

WHEN General Johnson first called the nation's attention to the rain of dead cats upon NRA, the blame was put upon industry. Today the descent of inanimate felines has become torrential, but industry no longer is the chief culprit. In a curious realignment of forces, industrial executives who advocate an extension of NIRA find themselves allied with A. F. of L. in opposing a strong host of miscellaneous factions who are bent upon destroying NIRA or changing it drastically. Even the Roosevelt administration, which once protected the infant NIRA with parental solicitude, now seems willing to permit the poor child to become a waif.

• • •

Thus, strange as it may seem, certain industries, with A. F. of L., are left holding the bag. Their task of inducing congress to pass legislation providing for the extension of NIRA in workable form will be difficult. Industry itself is far from agreement as to whether the act should be renewed or as to its form if it should be continued. This divergence of opinion is natural. Some industries, as for instance the steel founders (p. 10), have done a thorough job in perfecting smoothly functioning code machinery. Such industries are strongly in favor of extending the act. Others, whose codes have broken down, are indifferent to its fate.

What About NIRA?

• • •

In considering the problem of NRA, industrial employers cannot afford to overlook the labor relations aspect. Section 7a unquestionably has caused much unnecessary trouble. It was put over by a strong minority which hoped it would enable the leaders of that minority to impose their will upon the majority of industrial employes. But as bad as 7a has been and is now, it is much to be preferred over the pending Wagner bill, which very likely would supplant 7a if NIRA were not extended. The Wagner bill is designed to accomplish what 7a failed to do. Industry's attitude on NIRA should take into account the present political setup in congress. The A. F. of L. lobby is powerful. Congress has a strong anti-industry complex. These are realities which industry must face with determination.

Frying Pan To Fire?

• • •

Attentive readers of the personal items in STEEL probably have noted the increasing number of changes, promotions and additions in industry's research and sales promotion staffs. In this issue (pp. 19, 20) seven items relate to expanding activity in research and two indicate the extension of sales promotion work. We believe these and other signs of increased interest in research and promotion signify that management is alive to the necessity of furnishing strong reinforcements for its sales forces. Examine the organization of companies which are making exceptional progress in today's competition and invariably you will find that their salesmen are supported by efficient research and live sales promotion departments. This is a sign of healthy progress.

Research and Promotion

• • •

The actual physical volume of industrial activity has changed only slightly during the past month, but the flow of orders—which will determine the rate of activity in the coming weeks and months—is easing off. This latter fact, plus the nervousness arising from the political mess, has depressed business sentiment. Those who are inclined toward the gloomy view should not ignore the basic strength (p. 24) of the present business situation. . . . Automobile production last week (p. 16) is estimated at 100,065 units, the highest figure reported since the week ending May 24, 1930. . . . The experts who attempt annually to predict the iron ore movement on the Great Lakes (p. 21) venture the guess that it will be 30,000,000 tons this season. This would represent a gain of 35 per cent over 1934.

Are We Too Jittery?

E. L. Shaner

Witherow on Recovery Board; Steel Founders Back NRA

A MAN fully cognizant of the problems of the iron and steel industry went on the national industrial recovery board, which is now the supervisory body of NRA, when President Roosevelt last Friday appointed William P. Witherow, founder and former head of the Witherow Steel Corp., Pittsburgh, and since last August a resident member in Washington of the industrial advisory board of NRA.

At the same time, the President named Donald R. Richberg, former chief counsel of NRA, head of the emergency recovery council and coordinator of new deal activities, as acting chairman of the board, pending the passage of new legislation. He succeeds S. Clay Williams, tobacco manufacturer, who is voluntarily retiring.

Also on NIRB goes Philip Murray, vice president of the United Mine Workers and a close associate of John L. Lewis, president of the mine workers union and presumed to favor a more aggressive policy for the American Federation of Labor than President William Green.

Other Changes Coming

Considering that Sidney Hillman, head of the Amalgamated Clothing Workers' union, aready is a labor member of the NIRB, the new setup gives labor two representatives as against one for industry—Mr. Witherow.

In addition to Messrs. Richberg, Witherow, Murray and Hillman, NIRB includes Prof. Walton H. Hamilton, of Yale; Dr. Leon C. Marshall, a labor specialist but not generally regarded as a labor mouthpiece; and Arthur D. Whiteside, president of Dun & Bradstreet's. Mr. Whiteside has tendered his resignation but will remain until his successor is appointed.

Following his appointment Friday Mr. Richberg said he expects to remain a government member on the steel code authority. Leon Henderson, head of the NRA planning and research division, and Blackwell Smith, acting chief counsel, will no longer be ex-officio members of the board, he pointed out.

Mr. Richberg also expressed his belief that there is a need for adequate machinery for investigation and enforcement of section 7a (collective bargaining) outside NRA, especially since NRA seems to be moving into a new period in its development, and that pending enactment of new legislation it would be unwise to put new policies into effect.

"There should be no question of whole-hearted determination of the administration to carry forward an industrial recovery program, on the reasonable assumption that this will be approved by congress and extension of the recovery act will be authorized," said Mr. Richberg.

This recasting of NIRB comes at a time when NRA is under fire at the investigation conducted by the senate finance committee. Last week Clarence Darrow, famous criminal lawyer and former chief of the NRA consumers' board, was exceedingly mild in his attack upon the organization, considering that he differed bitterly with General Johnson and was expected to blow NRA out of the water.

By his appointment to the national industrial recovery board, announced Friday, William P. Witherow attains an eminence higher than that reached by any other iron and steel man in the Roosevelt administration. Only 47 years old, he opened his career in 1908 with the Jones & Laughlin Steel Corp. Beginning in 1911, as Irwin & Witherow, he represented the Truscon Steel Co. in Pittsburgh, two years later forming the Witherow Steel Corp., which was absorbed by the Republic Steel Corp. merger in 1930. In his company he developed the Witherow process of die rolling steel. Serving meanwhile as director of many companies and president of the Spencer Mfg. Co., Mr. Witherow in 1933 became head of the Steel Products Co., Pittsburgh. In August, 1934, he became a resident member in Washington of the industrial advisory board of NRA, leaving that post to go with NIRB

Mr. Darrow was by no means an offset for Mr. Richberg, whose testimony has been favorable to extension of NRA on a modified basis, the same as that of Mr. Williams.

It was reported in Washington last week that congressional leaders now have a tentative draft of what the President would like for the extension of NRA. It is predicted that the new bill will come out of the committee in good shape but will be loaded down in the senate with amendments which will hurt its effectiveness.

Late Friday, in an unusually strong statement, the President said NRA has the complete backing of the administration and he expects it to be extended for two years.

Industry Gives Stand

Thus far industry has not been prominent in the NRA hearings, but indications are that some strong arguments in favor of NRA will be advanced by it shortly. Typical is an open letter to members of congress submitted by the Steel Founders Society of America, New York.

Over the signature of Merrill G. Baker, executive vice president, the society declares the position of his industry as follows:

"The steel casting industry is convinced that the national recovery administration has exerted a powerful influence in improving and stabilizing conditions within this industry and regards it as unthinkable that these achievements shall be annulled through a failure to extend the Act which created it.

"This industry believes that the principles of the national industrial recovery act are fundamentally sound and eventually should be perpetuated through appropriate legislation. For the purpose, therefore, of retaining the gains that have been made and to acquire the further experience needed to develop the procedure to apply those principles and to have it enacted into permanent legislation, the steel casting industry recommends the extension of the national industrial recovery act for a period of at least two years in substantially its present form."

Maintaining that the steel casting industry is not interested in price fixing but is concerned with the open price plan under which it has been operating for 16 months, the society's brief contends that the open price plan with waiting period provides a method whereby prices of individual members of a trade or industry are published to all others concerned, but it is not a method of price fixing, does not eliminate fair competition, is not oppressive to small enterprises, is not against the public welfare, operates as a control

ity but does not involve coercion, intimidation or collusion.

Use of the open price plan with a waiting period should be encouraged, the industry declares, but without a waiting period the plan is meaningless and valueless. Mail order catalogs are cited as a perfect example of the open price plan.

Concluding, the brief states:

"The steel casting industry was one of the first to apply for a code after the enactment of the national industrial recovery act. It has consistently supported the national recovery administration, as evidenced by formal resolutions adopted at meetings of the industry and filed with the national recovery administration. The operation of its code has been beneficial to the members of the industry and is believed to have been fair to labor and its customers as well. The industry wants to continue under its code of fair competition and it will continue to support the administration of the national industrial recovery act under conditions that are just and fair.

"It believes, however, that one of these conditions is that there must be some provision for a legitimate measure of control tending toward stabilization of prices, and is of the opinion that giving full consideration to the interests of all concerned, one of the fairest and most satisfactory ways in which this can be accomplished in this industry is through the medium of the open price plan *with* a waiting period."

Basing Point Issue Quiets Down; Next Move Is Up to President

UP LIKE a rocket and down like the stick, describes the course of the conflicting NRA and federal trade commission reports on steel basing points which were made public March 15.

Although the reports were released by the President, it was plainly stated at the White House last week that he had not yet scanned them. During the course of the senate investigation of NRA, Senator King, of Utah, inserted part of the trade commission's findings in the records.

Action is up to the President, and in view of the fact NRA hangs by so slender a thread, the fate of the blue eagle must be decided first. If NRA is extended with price provisions sanctioned, it is believed the present status will be maintained. If NRA is dropped or shorn of price features, the trade commission is ready to pounce on the industry unless it names more basing points.

Following representations by southern steelmakers, Senator Bankhead of Alabama, author of an anti-basing point bill, has stated he will give the bill more study. Representative Huddleston, author of an identical bill in the house, also has heard from home, and the bills may not be pressed.

Only in Detroit is there noteworthy interest (see p. 15) in basing points, and there chiefly because it is the seat of an implacable attitude toward the steel code. Chicago and the East are satisfied, in general, with the present setup. Pittsburgh stands to lose more than other districts, but sees many obstacles ahead to consummation even of the NRA recommendation.

Summarizing the reports on basing points, the trade commission demands that iron and steel be quoted f.o.b. every point of production; NRA concedes some faults in the present basing point system, but urges group mill bases with 50-mile radii.

Comments from Pittsburgh, Chicago and the East follow:

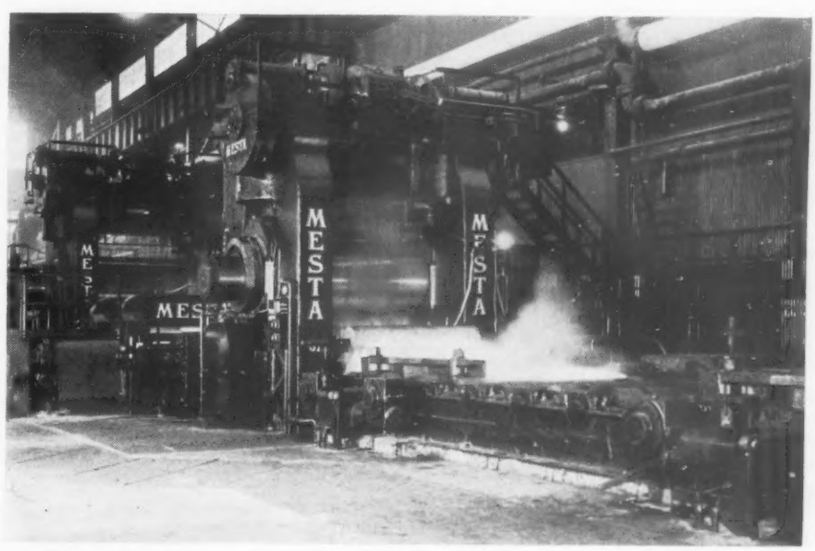
CHICAGO—While not faced with as serious consequences as some eastern producing centers in the event of consummation of certain proposed changes in the steel pricing system, mills and consumers of the Chicago district favor retention of the present basing plan or of no more than minor modifications.

The attitude of the average consumer is a natural one. He is interested in obtaining the lowest fair price on the steel he buys, but an equally important consideration is the price paid by his competitor. Any pricing method which would give an extra advantage to one consumer is opposed by those placed at a corresponding disadvantage. The present basing point system in general has been satisfactory to consumers here, consequently "why change?"

Chicago or Gary at present happens to be a basing point for practically all products made by local mills, except cold-rolled strip. Addition of new bases, consequently, would have little effect on the setup here. Being a relatively large steel consuming center, mills also are not faced with the threat of loss of tonnage such as would confront Pittsburgh and intermediate outlying plants, were pro-

(*Please turn to Page* 54)

The Pride of Sheet & Tube



Rumbling of new shiny 60-ton rolls. The shriek of a whistle reverberating through a hot mill building signals the heater to discharge a slab onto the approach table. A white hot slab, 7 inches thick and weighing 8 tons, advances through four stands of 4-high roughing rolls hissing as its surface is sprayed with water at 1000 pounds pressure. Forward it moves through six stands of 79-inch finishing mills and finally comes to rest in the form of a ⅛-inch light plate 35½ inches wide, the first to be rolled on the new continuous broad strip mill at the Campbell, O., works of the Youngstown Sheet & Tube Co. The first two stands of the roughing train of the new mill, which was built in seven months, are shown in the accompanying illustration

Republic Merger, in Court, Urged as Benefit to Industry

THAT the merger of the Republic Steel Corp., and Corrigan, McKinney Steel Co., will not eliminate "substantial competition" in the steel industry, as prohibited by the Clayton act; that it will not interfere with the ability of consumers to buy steel; and that it will not result in higher prices—these were the features of the defense in the hearing of the government's suit to enjoin the merger, in Cleveland last week.

On the contrary, their witnesses testified, the merger will unite two companies whose material reserves and manufacturing facilities are complementary; will lower production costs, and be beneficial to the public.

Testifying to these points for the defense were Tom M. Girdler, chairman; B. F. Fairless, first vice president, and P. F. Boyer, controller, of Republic; Donald B. Gillies, president, E. G. Resch, secretary-treastreasurer, R. C. Allen and J. E. Ferris, directors, of Corrigan, McKinney.

Attest Benefits of Proposal

Reinforcing the defense with testimony that the merger would not be inimical to public interest or the steel industry—that it would not interfere with competition, were these witnesses from other iron and steel companies: George M. Humphrey, president, M. A. Hanna Co., and chairman, executive committee, National Steel Corp.; W. W. Holloway, president, Wheeling Steel Corp.; E. M. Adams, vice president, Inland Steel Co., and W. W. Seebald, vice president, American Rolling Mill Co.

Hearing of the case was concluded at noon Friday, when both sides agreed to waive arguments, and the court indicated that a decision would be given by May 1.

"The real question here is whether the public will have to pay higher prices," said Mr. Girdler in his testimony. "It will not. There is no chance of this having a bearing on prices. We could increase prices, but we couldn't sell anything at the increased prices. Through economies effected we might be enabled to post a lower price, but never a higher price."

Mr. Girdler explained that this was true because of the competition in the industry, and the ability of buyers everywhere to purchase from many sources of supply. He said he was associated with the iron and steel industry 33 years, and government counsel asked him what had been his experience regarding combinations restricting trade.

"We have purchased large quantities of steel from other companies—still do; my experience has been that it has not affected our ability to buy, or prices that we pay."

"What is the competitive situation in the industry today?" he was asked.

"It is very acute. There is a large over-capacity. From pig iron to the most highly finished products purchasers have unlimited choice of sources from which they can buy."

The chairman said that competition between Republic and Corrigan, McKinney on such products as both sell is not serious. He then went on to explain how Republic normally does not have sufficient raw steel capacity for its finishing mills, whereas Corrigan, McKinney does not have enough finishing capacity to absorb its raw steel output. When Republic operates finishing mills at 65 to 70 per cent it must buy semifinished steel. Corrigan, McKinney has a large surplus capacity of pig iron and steel ingots.

"Republic," he said," can produce only 6 to 8 per cent of the country's sheets. It can make considerable cold rolled sheets, but it is not one of the important cold-rolled sheet producers. Newton Steel Co. (Corrigan, McKinney affiliate), on the other hand, has large capacity for cold-rolled sheets."

"Do you know of any district in the country where steel demand at any time would go unsatisfied?" he was asked by government counsel.

"No," he replied.

Mr. Girdler was recalled to the stand by the defense on the last day of the hearing, and he said that a merger of the four largest steel producers in the country could be effected, without a consequent advance in the price of steel.

Mr. Fairless, and other witnesses for the defense, denied that there would be a reduction in competition in the industry as a whole as a result of the merger. The government was driving to show that there would be a reduction between these two groups, while the defense tried to show the wide scope of competition generally in the industry, and that the merger would not upset this competition.

Exhibits Customer Lists

The government began its case by introducing 33 exhibits listing customers of the two groups, and the materials they purchase from each. Over the defense's objection, Judge Fred M. Raymond, in the United States district court, admitted them in evidence, but impounded them so they could not become available to other competitors.

The government then introduced ten charts bearing on the relative standing of the two, and their products. These also were admitted in evidence against defense's objections.

The government next called the purchasing agents of 14 companies which buy iron and steel from defendants. At the outset it explained that it had chosen these at random, and that it would not ask them to draw any conclusions as to the effect the merger would have on the market. The witnesses did not display any hostility to the merger.

For the most part their testimony concerned their routine duties as purchasing agents. All testified that many sources of supply always were open to them, in addition to Republic and Corrigan, McKinney.

It was during their testimony that the steel code came into the picture—the government touching the subject very lightly. The purchasers were asked what the steel salesmen do when they call and solicit business; what was the evidence of competition.

They replied that the sellers' competition is largely a matter of quality and service—since, one or two of them ventured, the government has set up a code providing uniform prices. Counsel for the government,

Steel Ingot Like Tepee

A STEEL ingot weighs only 500 pounds and is shaped like a tepee, according to the special assistant to the attorney general who handled the government's case against the Republic-Corrigan merger at Cleveland. Practical steelmen in the court room smiled broadly at some of the youthful attorney's descriptions. This from the transcript:

"Pig iron (he said) is made of three substances, viz., iron ore, coke, limestone. The three are brought together and melted and they produce pig iron . . . From that they manufacture ingots. Steel ingots, I believe, weigh about 500 pounds. Is that right?"—turning to counsel for the defense. "I understand they weigh about 500 pounds."

"Two to five tons," said W. B. Cockley, counsel for Republic.

"Thanks very much. About ten times that much. I understand they stand about this high (indicating 5 feet), and they taper off, something like a tepee. I have never seen one, and I cannot explain as fully as defendant's counsel may be able to."

prosecuting the merger, did not go any further into that.

The government was represented by Walter L. Rice and Russell Hardie, special assistants to the United States attorney general, reinforced by members of the Cleveland district federal attorney's staff, while the defense had a staff of seasoned lawyers, many of whom figured in the Youngstown Sheet & Tube-Bethlehem Steel merger suit. Whereas that suit was not initiated by the government, but arose over conflicting stock interests, this case was entirely at the instance of the government—with no stockholder or patron voicing disapproval.

500,000-Ton Bar Order Big?

The ineptness and inexperience of some of the government counsel in prosecuting the case brought out some amusing situations—to the spectators, most of whom were practical iron and steel men. There was the description of the steel ingot that weighs only 500 pounds and resembles an Indian tepee, portions of the transcript of which are appended.

Then one of the counsel astonished the audience by asking the following question:

"Would 500,000 tons of bars be a substantial order for Republic?"

War Unbalances Steel Trend Lines

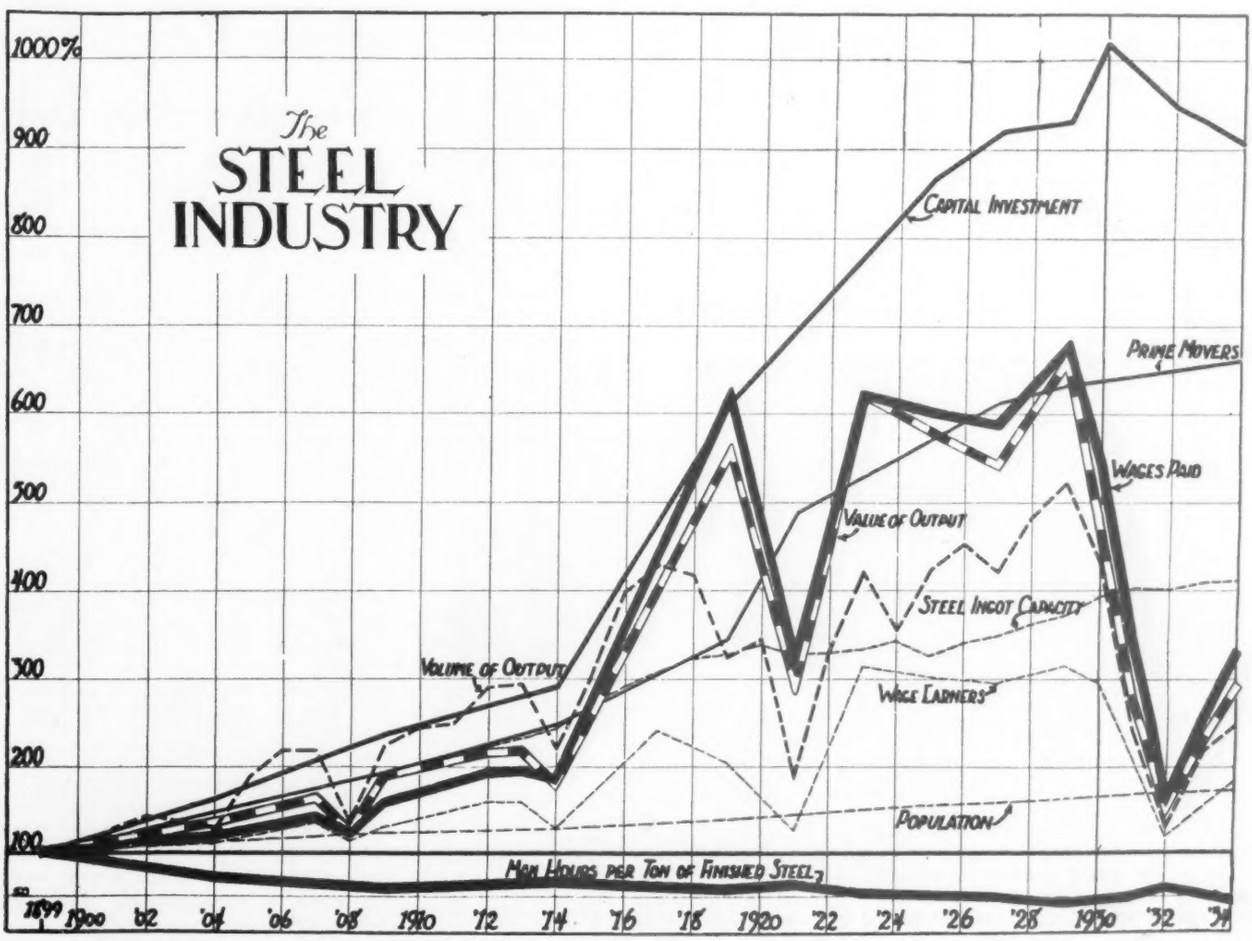
STARTING in 1899 and rating all basic factors for that year as 100, the iron and steel division of the department of commerce, of which Ralph L. Harding is chief, has charted for the iron and steel industry the trend of capital investment, output, capacity, population, number of employes, wages paid, value of output and prime movers utilized. This affords a graphic picture of the industry. These deductions are drawn by Mr. Harding:

"For 15 years the trends in capital investment, the use of power machines, the increase in capacity and the volume of output stayed relatively close to one another. After 1916 the capital investment increased far more rapidly than any other single factor—it ran far ahead of the capacity to produce or the actual volume of output. It is possible that the divergence in these trends may be related to the change in type of ownership which took place during those years.

"Until 1918 the relative increase in the use of power and machines and in the capacity to produce almost exactly coincided. Then the power trend shoots up and the spread between these lines is a direct indication of the extent to which machines and power replaced hand labor in the industry. The trend of increasing use of power bears about the same ratio to the trend of increasing capacity as the trend in output bears to the trend of the number of workers employed.

"The divergence of these pairs of trends is, of course, directly related to the decreasing number of man hours of labor entering into the production of a ton of steel—42-plus in 1899 and 18-plus in 1928 for certain items.

"Of particular interest is the relation between the two lines indicating increases through the years in total wages paid and in the total value of the output of the industry. Note that total wages have increased more than total value of product sold—that in times of depression the wages have decreased relatively less than the return from sales. This is a picture that the iron and steel industry has a right to be proud of, for the same graphs of the trends in all other manufacturing industries grouped together reverse the position of these



two lines. Their payrolls increased relatively less and receded relatively more than did the value of total output.

"Another plainly indicated fact is that the mounting capital investments, the increasing use of power and machines and the enlarging capacity for production have continued steadily the violent fluctuations of all other factors—those three cannot be adjusted to the rise and fall of demand as can employment, wages, production and price."

The figures and estimates upon which the various trends on the chart are based were derived from: Bureau of census reports, monthly labor statistics, records of the American Iron and Steel institute, and records of the American Iron and Steel association.

Production

REFLECTING a slight easiness in demand for iron and steel, due in large part to consumers restricting purchases until after uncertainties over extension of NRA are cleared away, the national steel average sagged 2 points last week to 46 per cent. Youngstown was the only district to record a gain last week, while losses were noted in the Pittsburgh, Chicago, Cleveland, Buffalo and New England territories. Details follow:

Cleveland-Lorain—Down 2 points to 70 per cent, National Tube Co., Lorain, O., dropping one open hearth and operating nine; Corrigan, McKinney Steel Co. continuing with ten and Otis Steel Co. with eight. National Tube also has blown out one of its blast furnaces at Lorain.

Youngstown—Up 2 points to 60 per cent last week, with tentative schedules for this week indicating a loss of 5 points to 55 per cent.

Pittsburgh—Down 3 points to 35 per cent, with no change expected this week. Production of semifinished steel for sheet and tin plate producers is virtually the only bright spot to local producers' schedules. Twenty-four out of 60 steelworks blast furnaces continue in operation.

Buffalo—Down 1 point to 37 per cent, with 15 open hearths in production. A dip of about 3 points is indicated for this week.

New England—At 51 per cent, ingot production went off 2 points last week. Tentative schedules for this week indicate little change.

Chicago—Declined 4 points to 47 per cent last week, lowest rate for the year to date, with the exception of the first week of January. Inland Steel Co. has lighted a third blast furnace, giving the district 14 active steelworks stacks out of 36. Two merchant furnaces also are in blast.

Holding steady last week were Birmingham at 55½ per cent, with steel ingot production going almost entirely into rails and sheets, although plans for continued production may be interrupted by a general strike in the coal mines; central eastern seaboard at 28 per cent, notwithstanding the general slowing up in demand of finished products; Wheeling at 92 per cent, and Detroit at 88.

Steelmaking Operations

Percentage of Open Hearth Ingot Capacity Engaged in 10 Leading Districts

	Week ended Mar. 23	Change	Same week 1934	Same week 1933
Pittsburgh	35	— 3	33	12½
Chicago	47	— 4	48½	12
Eastern Pa....	28	None	33	11
Youngstown ..	60	+ 2	56	13
Wheeling	92	None	66	†
Cleveland	70	— 2	82	29
Buffalo	37	— 1	52	14
Birmingham...	55½	None	52	15
New England	51	— 2	71	†
Detroit	88	None	100	†
	46	— 2	49	14

†Not reported in 1933.

SHEET SALES SLIDE OFF

Daily average sheet steel production in February was 7823 net tons; shipments, 7080 tons; sales, 6547 tons, according to the National Association of Flat Rolled Steel Manufacturers, Pittsburgh. Comparable averages for January were 7823, 7080, and 6547 tons—representing slight increases for output and shipments, and a substantial decrease in sales. Totals for February: Production, 219,062 tons; shipments, 201,054; sales, 183,322. Total sheet capacity in the country for February was approximately 550,000 tons, and the capacity on which the association's figures are based was 307,000 tons.

Steel Backs Up Low-Cost House

Its face is concrete, but its heart is steel. This house, of prefabricated panels of Earley Process mosaic concrete, was erected recently in the environs of Washington by the Earley Process Corp., National Press building, Washington, of which John J. Earley is president, Basil G. Taylor is vice president, and Oswald F. Schuette is secretary-treasurer. The panels are heavily reinforced with welded steel mesh. Vivid colors are obtained by "exposing" aggregates of naturally-colored quartz or bright-hued ceramics and vitreous enamels. For details of the method of casting the prefabricated walls see STEEL *for Dec. 3, 1934, p. 19*

Institute Rips Wagner Labor Bill

WAGNER labor disputes bill "rests upon the false and un-American theory that harmony and co-operation is impossible between employes and employers and its enactment would set the stage for a conflict which would injure the relations between employes and employers for all time and seriously retard national recovery," declares the American Iron and Steel institute, New York.

Further attacking the bill, the Institute maintains that labor organizations are free from any restrictions under the bill and can intimidate employes at will, that majority rule is intended to impose a closed shop and create monopoly in favor of professional unions, that 85 to 90 per cent of over 400,000 steel workers are standing behind their plans of collective bargaining and that the Amalgamated association enrolls only 5500 out of over 400,000 steel employes.

"The industry holds that any group of its employes is entitled to a fair, equal hearing and that no minority group should be arbitrarily subjected to the will of the majority in matters affecting hours, wages and conditions of employment," the Institute points out.

DETROIT

MICHIGAN'S first reaction to the NRA and federal trade commission reports on steel basing points was to throb with pride. It was assumed that the steel industry, rather than take on the federal government, would compromise and, among other things, recognize Detroit's position as a steel center by making it a base.

But steel is showing signs of refusing longer to be an under-dog, it is emerging from the spell of the new deal, and serious thinking here on exactly what a Detroit base would mean to the automobile area of Michigan from the standpoint both of production and consumption has tempered some of the early enthusiasm.

For one thing, it is being realized that a Detroit base would put the Ford Motor Co., this city's largest enterprise, at a disadvantage with its competitors in the local switching area. For another, it would react on the man who has done most to build up the city in a steel way and in whom there is much local pride—George Fink.

BAD EFFECT ON LABOR

For a third, consumers of steel in Detroit proper would gain an advantage of a dollar or more per ton over their competitors in Flint, Pontiac, Lansing, Saginaw and other Michigan cities, creating irritation and possibly a trend toward the concentration of parts manufacture in Detroit, which would not be good for the labor situation.

With two blast furnaces, ten open-hearth steel furnaces, and steel finishing capacity of about 1,000,000 tons annually, including the new continuous mill, Ford is a steel producer as well as an automobile manufacturer. Pending expansion of its ingot capacity, it is understood that Ford will divert semifinished steel to the new strip-sheet mill at the expense of the bar mill. Thus Ford will become a larger open-market buyer of bars, while easing out of the strip and sheet picture.

As a buyer of steel, Ford of course would benefit from any reduction in the delivered price, which a Detroit base presumably would effect. But as a producer, the higher the market the better for Ford, for these reasons—its high-cost mills would have a higher market price to work against, and its competitors would find their raw material costs running up. Making more steel than it buys, the more distant the base the better for Ford.

NO ADVANTAGE FOR NATIONAL

To George Fink more than any other individual does Detroit owe its eminence in steel. His Michigan Steel Co., built in 1923, and his Great Lakes Steel Corp., started in 1929, are the foundation of the local industry. Both are now part of the National Steel Corp., of which Mr. Fink is president.

Less than its competitors have figured, but enough to make its position happy, these units have benefited from the present basing point situation. For example, with No. 20 autobody sheets at 2.95c, Pittsburgh, the delivered price in Detroit is 3.15c, owing to the 20-cent freight differential. Thus the net to the Detroit mill has been 3.15c minus a switching charge of $16 per car. A competing Pittsburgh mill, however, has netted 3.15c minus the actual freight of 26½ cents, or 2.88½c.

There have been offsets, of course. As Detroit mills have sold to the south and west they have had to equalize freight. They have been under the necessity of bringing in semi-finished material from the Cleveland, Weirton and Chicago districts. The longer haul on coal is not neutralized by other operating economies. But in the main, the enterprise in setting up mills in Detroit has had its reward, and a local base would reduce the spread over other districts.

While the freight to Detroit from Pittsburgh is 26½ cents per 100 pounds, from Cleveland 20, Chicago 25 and Buffalo 23½, the arbitrary differentials created for Detroit for many products has redounded to consumers. On bars, for example, the Detroit delivered price is Pittsburgh base plus 15 cents, on sheets and strip 20 cents, with 5 cents higher to points in the middle Michigan belt.

Take carbon bars as an example of the possibilities of a Detroit base. Priced at 1.80c, Pittsburgh, the 15-cent differential lays them down in Detroit for 1.95c. If Detroit were made a base like Cleveland, Chicago and Gary, the Detroit base would be 1.85c. Thus the buyer would save $2 per ton minus switching.

For delivery at Flint, the present arbitrary is 20 cents, making the delivered price, 1.96½c, a reduction of a Detroit base of 1.85c, the 11¼-cent freight to Flint would make the delivered price 1.96¼, a reduction of 75 cents a ton. In event the Detroit base differential should be $2 over Pittsburgh, Flint buyers of bars would actually pay 25 cents more a ton than at present.

SMALL MARGINS BUILD UP

And let no one think that 25 cents a ton on any raw material is negligible. An executive will fight like a Bengal tiger to knock 25 cents off the price of a finished automobile. In the case of a car the size of Chevrolet, the weight of steel in the finished product is about 1600 pounds. Considering the scrap resulting in fabrication, probably 2000 pounds is bought for each car. Thus the saving per car is negligible, but when multiplied by upward of 3000 a day, it attains proportions.

The basing point reports have only

served to aggravate a tense situation between the steel and the automobile industries. The latter has been almost contemptuous of steel because of the price provisions of its code. Automobile executives feel they did a better job at Washington by inserting the merit clause in their code and restricting its provisions to maximum hours and minimum wages.

The wishful thinking of the automobile industry is that the entire NRA structure die by default June 16, or if extended that codes be denuded of price controls, leading to a wide open market. Cut-throat competition among vendors is the vision. In fact, typifying the feeling, the Detroit city purchasing department has restricted its purchases to bare necessities in the hope of great competition after June 16, which is also characteristic of some steel consumers and supplies a reason for the lagging steel operating rate.

CAR SALES ARE "DETROIT-PLUS"

Steel sellers, on the other hand, compare the automobile industry's opposition to Pittsburgh-plus, so-called, with the Detroit-plus which Ford and Chevrolet impose on their products. No matter where these cars are assembled, or how short the haul on parts to these branch assembly plants, the delivered price is figured on the basis of the car being shipped from Detroit or Flint. Other makers, with an exception for some Pacific coast branches, ship from the point at which they assemble.

The civic pride of Detroit in its steel industry is enormous. The district is getting a reputation for making steel, whereas it really is a finishing point. Out of 280 blast furnaces in the United States, Detroit lists four. Out of 70,000,000 tons of ingot capacity, Detroit accounts for about 1,300,000 tons. But finishing capacity is relatively much higher, the principal products being:

Hot-rolled strip — Ford, 500,000 tons; National, 300,000 tons plus 500,000 tons in the new mill; McLouth Steel Corp., 48,000 tons.

Cold-rolled strip — Detroit Steel Corp., 60,000 tons; Newton Steel Co. at Monroe, 10,000 tons; Rotary Electric Steel Co., 24,000 tons; Bopp Steel Corp., 12,000 tons; both Ford and National whatever proportion of their hot strip tonnage they choose to cold roll.

Sheets — National, 214,000 tons; Newton Steel Co. at Monroe, 200,000 tons.

Carbon bars—Ford, 480,000 tons; National, 336,000 tons. Some of Ford's capacity may also be credited to alloy bars.

Tubes — Detroit Seamless Steel Tubes Co., 36,000 tons; Michigan Seamless Tube Co., 12,000 tons; plus several cold tube-forming companies.

And, to Detroit's way of thinking, this is only a start. The handicap of absorbing freight to meet a local base—assuming of course that one is granted—is expected to drive outside producers into the district. The American Rolling Mill Co. formerly had a favorable site sought of Detroit on option. There is some speculation whether the United States Steel Corp. and Bethlehem Steel Co. regret not buying the Ford mill when it could have been had in 1932.

At present, the city is doing quite well in new capacity. The continuous mill which the United Engineering & Foundry Co. has built for Ford is largely on the ground at Dearborn, awaiting the completion of foundations. Additional piles are now being driven. Fabricators also get the jitters when they contemplate the problem of erecting steel for National's new continuous mill building at Ecorse; they face a lift of 90 feet with some material.

Regardless of the price control provisions of the steel code, any lifting of restrictions on new capacity would result in swift action here. National is expected to build more open hearths, not only to supply the new continuous mill but also to provide tin mill black sheets for the tin plate mill National may build at Williams, Ind., near Gary.

EQUIPMENT SET FOR ACTION

Recent repairs to the Hanna blast furnace stacks at Zug Island will prove no handicap in enlarging their capacity once the lid is lifted. Ford, not bound by the steel code, is increasing his stacks from 600 tons daily to 800.

Although the pressure for finished material has eased considerably, National is operating its open hearths full, building up a supply of semi-finished material. It has ceased, however, shipping in billets and sheet bars from other districts.

Steel demand generally has toned down. March shipments into Detroit by most producers will about equal those of February, owing to the advantage of two additional days. But unlike a month ago, shipments are not being replaced by orders and mill backlogs are greatly depleted. These heavy March shipments forecast a strong automobile assembly situation in April. May is still in the lap of the gods.

A sure indicator that consumers are getting filled up is the wave of rejections, especially of flat-rolled material. There is no doubt that, over the past few months mills have shipped substandard material and consumers have accepted it owing to the press for steel. But now inspection can be more rigid, and some large lots of sheets are reported to be available as seconds.

Ford, incidentally, continues to take in large tonnages of open-hearth scrap from other Detroit automobile plants, including some of its body suppliers, and the accumulation at Dearborn is getting to be large.

COMBINATION BODY MODEL OUT

Chrysler engineers continue to earn their reputation for being extremely enterprising and vigorous. As an example, they are now bringing out in the Plymouth line a dual purpose commercial sedan, priced at $635. Appearing to be a 2-door sedan, this model has a third door, 34¼ inches wide by 42½ inches high, in the rear.

As a family car, this model is a 2-door sedan, only the hinges of the rear door betraying its commercial possibilities. But out lifts the rear seat, panels are snapped inside the rear windows to protect the glass and provide a space for signs, and a floor area of 2700 square inches is available for loading.

Plymouth gave steel a break in equipping its by-way model with steel disk wheels. Designed for use in rural communities and over mud roads, this model has 20-inch wheels, instead of the usual 16 or 17, and disk wheels are used this year because they are less likely to cake with mud than wooden ones.

Steel also benefits from the turret steel top which LaSalle has adopted for its 1935 series, just out. The inside trim and the instrument boards, of course, are entirely different, but the fact is the body shells of Pontiac, Olds and LaSalle come off the same dies. Chrysler does the same with most of its line. Perhaps the time will come when prospective buyers will be offered their choice of any engine in a standard body. The new LaSalles are several hundred dollars cheaper, just above

(*Please turn to Page* 18)

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

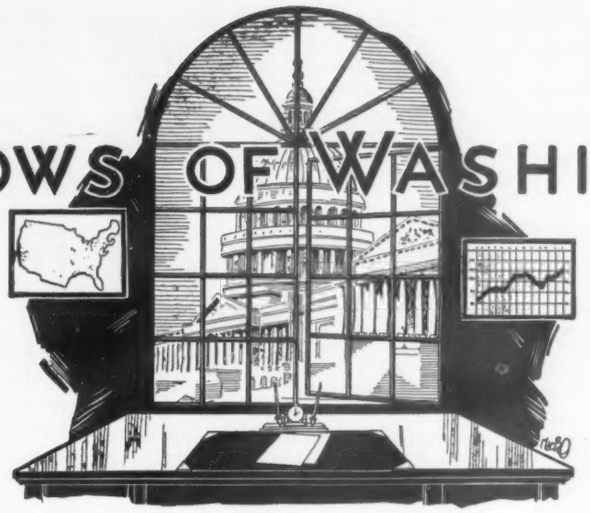
	1933	1934	1935
Jan.	128,825	156,907	292,765
Feb.	105,447	231,707	335,000*
2 mo.	234,269	388,614	627,765
Mar.	115,272	331,263	.....
Apr.	176,432	354,745	.....
May	214,411	331,652	.....
June	249,727	308,065	.....
July	229,357	266,576	.....
Aug.	232,855	234,810	.....
Sept.	191,800	168,171	.....
Oct.	134,683	132,491	.....
Nov.	60,683	78,465	.....
Dec.	80,656	183,187	.....
Year	1,920,057	2,778,739	.....

*Estimated.

Estimated by *Cram's Reports*

Week ended:	
Mar. 2	83,899
Mar. 9	86,375
Mar. 16	97,090
Mar. 23	100,065

WINDOWS OF WASHINGTON



WASHINGTON

FOR a few days last week the repercussions of the conflicting NRA and federal trade commission reports on steel basing points drowned out the rest of the discord and uncertainty in Washington, but the overtones of the labor situation are breaking through and again becoming distinctly audible.

Congress last week appeared to display renewed interest in labor, and while the President has topped the A. F. of L. on the issue of prevailing wages on work relief projects, organized labor more than offset this by winning the appointment of Philip Murray, of the United Mine Workers, on the reorganized national industrial recovery board. Those who are politically minded, in fact, regard this as a *quid pro quo*.

Labor got a leg up on the Black 30-hour work-week bill when the senate judiciary committee last week ordered a favorable report. The committee was by no means unanimous but Senator Neely, of West Virginia, as leader of the majority, downed Senator Austin, of Vermont, who made a minority report.

Action Seen This Session

At the last session of congress, it will be recalled, a similar bill passed the senate but was sidetracked in the house and never came to a vote. The understanding in the house was that NRA would be given a chance to prove what it could do for labor. With NRA in increasing disrepute, chances are of the bill passing both houses this session.

Industry appears to be generating more intense hostility to the Wagner labor disputes bill, which would rivet section 7a, majority rule, and an independent labor board on the country, but the fact is that industry is only now becoming conscious of the danger.

This coming Tuesday more representatives of the steel industry will appear before the senate committee on education and labor to oppose it, including F. E. Fieger, Jones & Laughlin Steel Corp., Pittsburgh; E. J. Poole, Carpenter Steel Co., Reading, Pa., and a representative of the Keystone Steel & Wire Co., Peoria, Ill.

Last week several Washington correspondents braved the White House embargo on questioning the President on measures pending in congress, by quizzing him on the Wagner bill but the President sidestepped the issue by saying he might comment later.

Held Dangerous and Destructive

James R. Emery, counsel for the National Association of Manufacturers, developed the dangerous and destructive effects of the Wagner bill, in testifying before the committee, calling particular attention to the fact that it does not ban coercion or intimidation "from any source."

On many issues William Green, president of the A. F. of L., and John L. Lewis, president of the United Mine Workers, do not see eye to eye, but last week they joined hands in favoring both the Wagner bill and the allied Connery bill in the house.

Mr. Lewis attacked Donald Richberg on the ground his interpretations of section 7a "have encouraged the institution of company unions." Mr. Green maintained that 7a has accomplished much in the past two years "in spite of the deliberate evasion of employers."

Tactics of communists in attempting to bore into the labor movement in the steel and automobile industries were disclosed last week by publication of a progress report accredited to the national secretary of the communist party:

"In the steel industry, we withdrew our Red union, the Steel and Metal Workers Industrial union, and confined it to the field of light metal and machinery, sending all our steel workers into the A. F. of L. union, the Amalgamated Association of Iron, Steel and Tin Workers, with the result that in a few weeks we have begun to crystallize a great national rank-and-file movement to prepare for strike in the spring, a movement which already has serious organizational strongholds in the union, basic American cadres of leaders, and excellent prospects for a great mass movement.

"In the auto industry, we have dissolved the Red Auto Workers union, sending the members into the A. F. of L. federal local unions, and already have under way a serious movement for the uniting of the 80 to 90 locals in the industry into an industrial union within the A. F. of L., a movement which forced the recent national convention of the A. F. of L. to grant industrial union form of organization to the auto industry, as well as to others. . . . ."

FEAR BRAZIL MANGANESE TARIFF CUT WILL SPREAD

Plans are now being considered by members of congress, whereby the further development of the domestic manganese industry may be continued without interference with the Brazilian trade agreement.

In this connection certain members of congress who have been much interested in manganese have sent a communication to the President in which they state:

"If necessary, resolutions or legislation will be proposed in this congress to bring about the desired results without conflict with the purposes of the state department.

"It appears that the Brazilian trade agreement, when proclaimed, will automatically extend to other nations the same reduction in the duty on manganese as will apply to Brazil unless such extensions are withheld by the United States at the time of the proclamation.

"We therefore respectfully request that the application of the cut in the manganese duty be withheld from India, Africa, Russia and other manganese producing countries until this matter can be further considered.

"Under the term of the Brazilian

trade agreement and the provisions of NRA we further request that an allotment of tonnage of manganese ore to be imported from Brazil be set forth by the administration so that importations of manganese ore from Brazil may not render or tend to render ineffective the proper administration of the manganese code and the further employment of labor under such code."

EVEN REWRITTEN, STRUCTURAL STEEL CODE DRAGS

There was little progress last week in connection with the revised structural steel code at NRA. Copies of the rewritten code have been submitted to the various advisory boards of NRA, but in spite of the fact that officials are trying to hurry along its consideration, it is expected it will be some time before anything definite is accomplished.

This code has been shunted back and forth from one division of NRA to another and from one official to another for months, with some representative of the industry spending a great deal of time in Washington. To date little or no progress can be shown. Even as the code has been rewritten, it is reported, it does not suit some of the elements of NRA.

AND IN AN AUTO AGE!

The President has ordered the tariff commission to make an investigation under section 3e of the recovery act of the importation into the United States of horse and mule shoes.

Hearing will be held on April 23, at which time information will be received on the question as to whether such articles are being imported in substantial quantities or increasing ratio to domestic production and on such terms or under such conditions as to render ineffective or seriously to endanger the maintenance of the code of the horseshoe and allied products manufacturing industry.

Mirrors of Motordom

(*Concluded from Page* 16)

the new Packard which, incidentally, has reached a daily production of 200.

The automotive specialists here are saying that William B. Stout has brought the future to the present in his new rear-engine Scarab car. While only one has been built, he is now putting four more through the shop, and plans to get them into the hands of "big names" in Detroit, with the thought that a few cars wisely placed will do more to get the thing across than any high-pressure advertising or publicity.

Recently the Stout Scarab was taken down to the beach at Daytona, Fla., and Sir Malcolm Campbell induced to take the wheel for a spin up and down the speedway. Sir Malcolm was favorably impressed with the new creation, it is reported.

If you would like one for your garage, Mr. Stout will take your order for $5000, although its construction, if placed on the quantity basis of Ford, Chevrolet and Plymouth, would involve no additional cost over present designs and the car could be sold in the $700 price range. It has a standard length, although the wheelbase is 136 inches, contrasted with 112 inches in popular low-price cars. Wheel suspension is copied from the airplane landing gear, with large oleos on each wheel. Passengers can eat lunch comfortably while riding at 50 miles per hour.

Hudson-Terraplane became conscious last week that, as noted in this department a week ago, it is marketing the only bona fide all-steel body, and in front of the offices on East Jefferson avenue this large sign blossomed out: "America's only bodies all of steel—Hudson's and Terraplane's."

1,000,000 TOTAL FOR QUARTER

Assemblies of the industry last week increased to slightly over 100,000 units, giving assurance that March production of passenger cars and trucks will probably top 400,000 units. This will give the first quarter a total of at least 1,000,000 units.

Ford last week held at slightly over 6000 units a day, six days, or 36,000 for the week. Chevrolet increased to about 22,000 units last week. Plymouth held at slightly under 10,000 units.

Chevrolet's late start on master models apparently will offset the expected moderate decline by Ford and probably also by Plymouth in April. Ford continues pressed to make deliveries on two-door sedans with trunks—the most popular model of all makers, in fact.

Carried along by the trend toward diversification, which has led other parts makers into the manufacture of sinks, bath tubs and other pressed steel products, Thompson Products Inc. is expected to embark on the production of electric kitchen stoves, possibly in Detroit. A big market is visioned in the West and South through cheap power from the Boulder dam and TVA projects. Kelvinator will make and retail Electromaster stoves

Ford is installing radio loudspeakers just above the rear vision mirror in the car header, for better distribution of sound.

Studebaker has issued holdups on some parts. Partsmakers generally are more cautious in making material commitments.

NRA

IMPORT section of NRA is investigating a complaint against imports of pig iron. The complaint, filed by a tariff committee representing merchant producers of pig iron whose furnaces are located in the eastern seaboard area, alleges that increasing imports of pig iron from the Netherlands and British India threaten to render the steel code ineffective.

Foreign Trade

FEBRUARY imports of iron and steel at 28,905 tons compare with 22,784 tons in January and 25,407 in February, 1934. For two months of 1935, imports total 51,689 tons, against 48,060 a year ago, according to iron and steel division of the department of commerce, Washington.

New Capacity

ALGOMA STEEL CORP., Sault Ste. Marie, Ont., on March 19 began rolling structural shapes as large as 15-inch I-beams and channels, believed to be the largest sections thus far rolled in Canada. Heretofore, the company has been able to roll only up to 6-inch I-beams and 7-inch channels, but can now supply sizes between this range and 15 inches, if demand warrants.

Steel in the News

OUT of the hearings of the special senate committee investigating munitions, during which steel has been pilloried for alleged war profits, appears to be coming a bill designed to accomplish the following:

Limit individual incomes to $10,000, taking all excess in income taxes; levy a 50 per cent tax on the first 6 per cent profits of corporations making war supplies, and 100 per cent on all above 6 per cent; publicity of all salaries immediately on declaration of war; licensing of industries, establishment of priorities in purchasing, and price fixing where essential; drafting of all industrial management; closing of all commodity exchanges; imposing income taves on everyone from $1000 up.

ARGUE McCLINTIC VALUE

Steel continued to figure largely in the fifth week of the income tax hearing at Pittsburgh involving Andrew W. Mellon, former secretary of the treasury, and his connection with the McClintic-Marshall Corp., now a subsidiary of the Bethlehem Steel Corp.

The difference between Mr. Mellon's valuation of $500 a share on the McClintic-Marshall common in 1913 and the government's contention it was worth only $158, viewed in the light of Mr. Mellon's tax liability in 1931, means $100,000 in income tax which the government seeks to collect.

Industrial Men in the Day's News

ALBERT N. KOCH has resigned as manager of warehouse steel sales for Whitehead & Kales Co., Detroit, to become president of the newly-formed Steel Plate & Shape Corp., Detroit. The new company will do a general steel warehousing business and will be equipped to fabricate specialty products. Mr. Koch is a graduate of Armour Institute of Technology and following war service was associated with Joseph T. Ryerson & Son Inc. in Chicago and Detroit. Later he organized the warehouse division of Whitehead & Kales.

♦ ♦ ♦

Erle G. Hill has been named director of research for Lukens Steel Co., Coatesville, Pa. Born in Santa Ana, Calif., he studied mining and metallurgical engineering at the University of California. After graduation in 1913, he took graduate work at the University of California, Carnegie Institute of Technology and the University of Pittsburgh. In 1918 he became an instructor in mining and metallurgy at Carnegie Institute. In 1920, he became an associate professor of metallurgy at the University of Pittsburgh, serving there for ten years, during which time he also

Erle G. Hill

functioned as consultant for various companies in mining and metallurgical fields. He resigned in 1930 to accept a research fellowship at the Mellon Institute of Industrial Research, remaining in that work until he joined Lukens Steel.

♦ ♦ ♦

C. T. Greenidge, formerly research metallurgist with the A. O. Smith Corp., Milwaukee, has been appointed to the technical staff of Battelle Memorial institute, Columbus, O., in connection with a new industrial project in the metallurgy of steel established at the institute.

Carlos M. Heath, at one time associated with the metallurgical department of the American Brass Co., Waterbury, Conn., also has been named to the Battelle staff, to work in connection with a new metallurgical project in the nonferrous field.

Dr. Bruce A. Rogers, formerly in charge of a survey of the engineering uses of silver at the national bureau of standards, Washington, and well known for his activities in the field of magnetic age-hardening iron alloys and high temperature microscopy, has been appointed senior metallurgist at Battelle on a new program of research relating to the automotive industry.

Myron R. Nestor, a University of Minnesota graduate, and Philip C. Rosenthal, a University of Wisconsin graduate, have been appointed to the technical staff at Battelle.

♦ ♦ ♦

Anthony S. Teiberis has been appointed general manager of the Columbus Truck & Supply Mfg. Co., Columbus, Ga., manufacturer of textile trucks, textile dyeing machinery and equipment. He formerly was vice president of the Master Tool Co., Cleveland, where he developed a process of rebuilding portable pneumatic tools and of bringing them back to their original standard size.

♦ ♦ ♦

James R. Buck of Chicago has been elected chairman and president of the Federal Screw Works, Detroit, succeeding Ray Potter as chairman and R. A. Gunn as president, the latter having resigned, the former continuing as director. P. E. Garlent and E. W. Stewart have been elected vice presidents. J. F. Sorauf has been

William H. Seaman, Vice President in Charge of Rolls, Mesta Machine Co.

From many years of experience in the roll business he has gained a thorough practical knowledge.

Over the past decade he has been vice president of a leading roll interest in the Chicago territory.

He now returns to the Pittsburgh district, the scene of his early education and industrial training.

WILLIAM H. SEAMAN, vice president of Continental Roll & Steel Foundry Co., East Chicago, Ind., has resigned to become vice president in charge of roll activities for Mesta Machine Co., Pittsburgh.

His experience of many years has been devoted almost entirely to the roll business, and to his new post he brings a thorough background of practical knowledge.

He attended Washington and Jefferson college and Carnegie Institute of Technology. One of his earliest affiliations was with the Seaman-Sleeth Co., Pittsburgh, later the Pittsburgh Rolls Corp. In 1924, he left the latter to become vice president in charge of rolls for the Hubbard Steel Foundry Co., Chicago.

Six years later, Continental Roll & Steel Foundry Co. was formed, taking in the Hubbard Steel Foundry Co. among other interests in the Pittsburgh and Wheeling, W. Va. districts. At that time, Mr. Seaman became vice president in charge of rolls for the parent company, continuing in this post until his recent change.

elected treasurer, succeeding E. E. Vender.

♦ ♦ ♦

Harvey H. Brown has been elected to the board of directors of Eaton Mfg. Co., Cleveland. Other directors have been re-elected.

♦ ♦ ♦

Ray Crow, former chief engineer of the Alabama relief administration, has been appointed to take charge of a division of the farm agent's office of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., to develop new uses for steel on farms.

♦ ♦ ♦

Stanley S. Boyer has been elected president and general manager of the Herbrand Corp., Fremont, O., reorganized drop forge interest. E. H. Schwab, of New York, has been named chairman; R. O. Mead, of Detroit, vice president; and C. Traub Gottron, secretary-treasurer.

♦ ♦ ♦

R. M. Lowe has joined the equipment sales division of the All-Steel Equip Co. Inc., Aurora, Ill. For seven years he has been Pittsburgh district manager for the Medart Mfg. Co., St. Louis, previously having been associated with the engineering department of the American Car & Foundry Co.

♦ ♦ ♦

R. W. Frawley, for 30 years a member of the sales staff of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., has been named new sales promotion manager for the Gulf States Steel Co., Birmingham.

N. G. Bradford, also formerly with the Tennessee company, will be assistant sales promotion manager at Gulf States.

♦ ♦ ♦

G. A. Seyler, Lunkenheimer Co., Cincinnati, has been elected president of the Cincinnati branch of the National Metal Trades association. Other officers elected recently include: Vice president, R. E. LeBlond, R. K. LeBlond Machine Tool Co.; treasurer, Leroy G. Brooks Jr., Tool Steel Gear & Pinion Co.; and secretary, O. E. Schauer, Cincinnati-Bickford Tool Co.

♦ ♦ ♦

W. Worley Kerlin, for a number of years active in the foundry industry, has been appointed metallurgist for the Meehanite Metal Corp., Pittsburgh. His past associations include Packard Motor Car Co., Detroit; Valley Mould & Iron Corp., Sharpsville, Pa.; American Radiator Co., Buffalo; Enterprise Sand Co., Pittsburgh and Conneaut, O.; Superior Foundry Co., Cleveland; and recently the Michigan Valve & Foundry Co., Detroit. Since 1931 he has devoted considerable time to the technical department of the Gray Iron institute, Cleveland.

♦ ♦ ♦

Miss Fannie J. Dacus, local cashier and secretary to the manager of the Detroit office of the Carnegie Steel Co., Illinois Steel Co. and Tennessee Coal, Iron & Railroad Co., will retire March 31 under the retirement plan of the United States Steel Corp. Formerly in the same capacity in the St. Louis office of these three steelmaking companies, Miss Dacus has been in the Detroit office since 1919, being transferred with William B. Weston, who on March 1 was elevated to assistant to the vice president and general manager of sales of the Carnegie company in Pittsburgh. No woman in the Steel corporation, and probably in the entire industry, is believed to have such a wide acquaintance with sales executives and so comprehensive a knowledge of steel selling problems as Miss Dacus.

Financial

JONES & LAUGHLIN STEEL CORP., Pittsburgh, reports total loss of $806,173 in the fourth quarter of 1934, compared with total loss of $1,826,227 in the third quarter of 1934, and total loss of $626,418 in the fourth quarter of 1933. Indicated loss for the year ended Dec. 31, 1934 is $3,670,672, compared with total loss of $5,366,997 in 1933.

In 1934, the company earned $1,529,332 from operations. Depreciation and depletion reserves of $4,856,679 changed this to a loss of $3,327,357. Bond interest was $343,315, making total loss of $3,670,672. No preferred dividends were paid during the year.

COURT SANCTIONS PLANT BUY

Receivers for Williamsport Wire Rope Co., Williamsport, Pa., were granted permission last week to pay the balance of $87,000 necessary to acquire ownership of the company's branch plant at Sparrows Point, Md., which has been the property of the Beth-Mary Steel Corp., a subsidiary of the Bethlehem Steel Co.

HEAR CFI PLAN APRIL 29

Colorado Fuel & Iron Co. plan for reorganization is before the federal district court at Denver, and a hearing will be held April 29. Proposed recapitalization will include $4,500,000 of sinking fund 5 per cent bonds, $11,053,200 in income mortgage bonds, 552,660 shares of common stock, and warrants to purchase 350,379 shares of common.

WHEELING RETURNS TO BLACK

Wheeling Steel Corp., Wheeling, W. Va., in its annual report for 1934 notes: Net of $529,202, against deficit of $284,430 in 1933; total assets Dec. 31 totaling $27,508,559, and liabilities of $4,524,670; capital expenditures, including the new cold rolling tin mill at Yorkville, O., $4,221,756; sales, $48,924,844; average number of employes, 15,186; total payroll, $19,759,347.

G. E. SHOWING IMPROVES

General Electric Co., Schenectady, N. Y., reports for 1934: Orders totaling $184,000,000, up 29 per cent; sales billed $164,797,000, increase of 21 per cent; average number of employes, 49,642; total earnings of employes, $75,227,000.

USE OF NICKEL EXPANDS

International Nickel Co. of Canada Ltd., Copper Cliff, Ont., reports for 1934: Net of $18,487,478; sales including nickel in alloys, 91,459,554 pounds; estimated total consumption of world nickel in all forms, 122,000,000 pounds; sales of monel metal, 10,763,821 pounds.

OTHER FINANCIAL REPORTS

Dominion Steel & Coal Corp. Ltd., Montreal, Que., 1934, profit of $674,936; 1933, deficit of $408,502.

American Chain Co. and subsidiaries, Bridgeport, Conn., 1934, profit of $491,875; 1933, loss of $431,765.

Timken Roller Bearing Co., Canton, O., 1934, net of $3,486,056; 1933, profit of $2,172,850.

United States Pipe & Foundry Co., Burlington, N. J., 1934, net of $818,068; 1933, loss of $71,452.

Milton Mfg. Co., Milton, Pa., 1934, deficit of $12,296.

F. E. Myers & Bros. Co., Ashland, O., quarter ended Jan. 31, 1934, net of $152,035; quarter ended Jan. 31, 1933, net of $83,267.

Rustless Iron & Steel Corp., Baltimore, 1934, net loss of $23,033.

¶Steel Co. of Canada Ltd., Hamilton, Ont., shows net of $2,020,640 in 1934, or triple the profit of $676,074 in 1933.

¶National Enameling & Stamping Co., Granite City, Ill., reports net profit of $372,591 for 1934, against net of $274,097 in 1933.

Died:

WILLIAM B. ALEXANDER, 50, general superintendent and a director of the National Screw & Mfg. Co., Cleveland, in that city, March 17. After early schooling in Cleveland, he entered the National Screw organization, which was founded by his father, the late W. D. B. Alexander. A brother, Harold, is president of the company.

♦ ♦ ♦

Ralph H. Clore, general manager, Medart Co., St. Louis, March 6.

♦ ♦ ♦

William R. O'Donovan, superin-

tendent of the foundry department at the Homestead works of Carnegie Steel Co., in Pittsburgh, March 18.

♦ ♦ ♦

D. O. MacQuarrie, 71, manager at Chicago for the Corbin Cabinet Lock Co., and vice president of the American Hardware Corp., New Britain, Conn., in Chicago, March 18.

♦ ♦ ♦

J. M. Eastham, 71, president of the Rudisill Foundry Co., Anniston, Ala., in Sarasota, Fla., March 13. For many years he had been prominently connected with financial and industrial interests of Anniston.

♦ ♦ ♦

Albert J. Williamson, 85, paymaster and cashier of the National Tube Co. works, McKeesport, Pa., for 27 years, and later with the Witherow Steel Co., Neville Island, Pittsburgh, now a part of Republic Steel Corp., in Wilkinsburg, Pa., March 11.

30,000,000 Tons Is Iron Ore Aim

PRELIMINARY to the opening of the season for Lake Superior iron ore shipments, the "open season" for guessing the tonnage that will be required this year is in full swing.

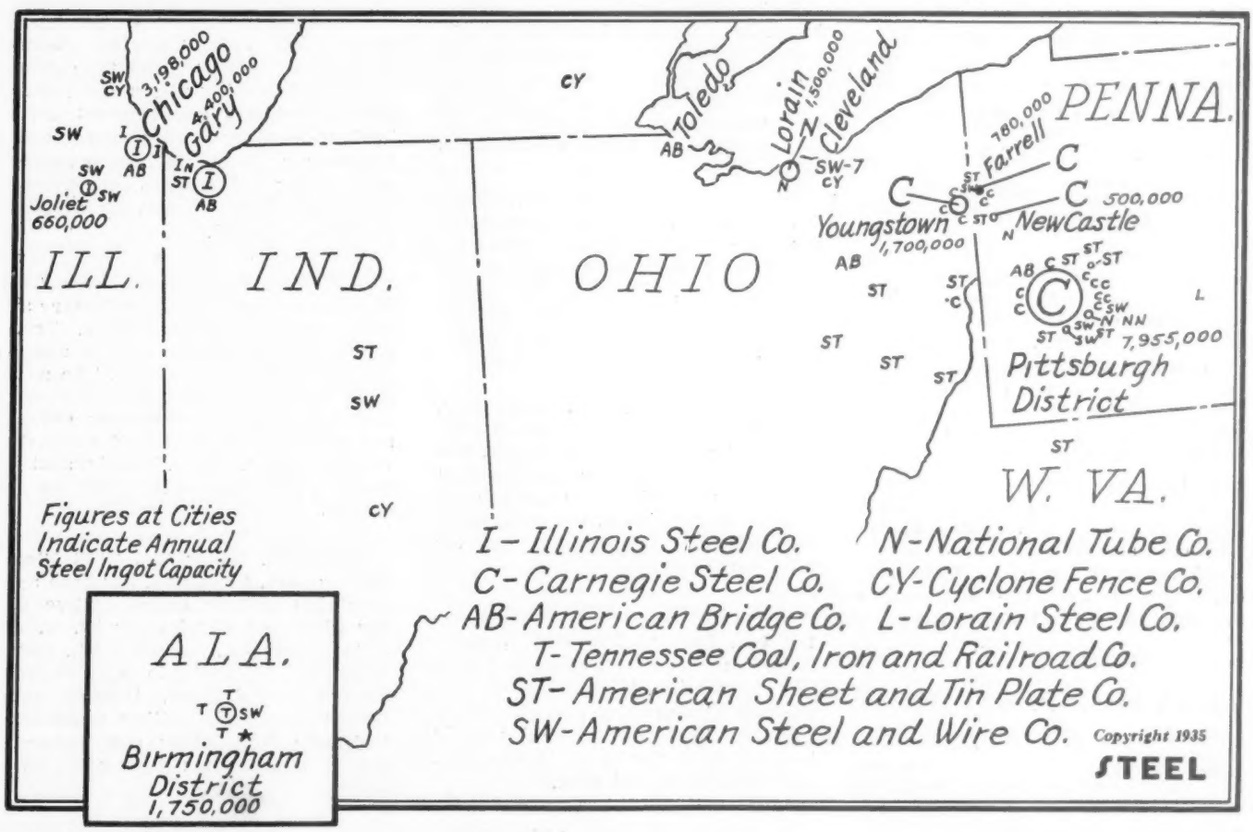
Prior to the depression producers' statistical departments compiled at this time each year sets of figures by which they estimated the steel industry's iron ore needs 12 months in advance. They prepared their early shipping schedules accordingly, and in a surprising number of instances their estimates hit the mark. That was when business was normal.

Since 1929, however, so many estimates have failed that the best estimators frankly and smilingly say they have given up estimating and will only guess. Their best guess at this time is 30,000,000 tons, and this compares with actual 22,249,600 tons in 1933; 21,623,898 tons in 1933, and 3,567,985 tons in 1932.

This 30,000,000 tons for 1935 represents only the intuition of a half dozen men who have devoted their lives to the iron ore business. It is not based on anything tangible—no inquiries have been received, no shipping schedules prepared, consuming companies have not yet made up specifications for early shipment. Nevertheless, it is the figure at which the producers will aim, until something changes their views.

Examining it a little more closely, this 30,000,000 is an increase of 35 per cent over 1934, whereas steel production so far this year is only 12 per cent above the average of last year. Even if iron ore consumption should continue until May 1 at the February rate there still will be available at lower lake ports and furnaces at

Most U. S. Steel Corp. Subsidiary Plants Are Clustered About Pittsburgh



RUMORS that headquarters of the United States Steel Corp. may be transferred from New York to Pittsburgh have prompted STEEL to spot on the above map the Middle West plants of various subsidiaries of the Steel corporation. The most striking reaction is the apparent great concentration of individual subsidiary plants in the Pittsburgh-Youngstown-New Castle district as against the comparatively few plants but almost the equivalent ingot capacity in the Chicago district. Ingot capacity is denoted by the large circles, while the small keyed lettering indicates individual plants. In addition to the Steel corporation's subsidiary plants above noted there is ingot capacity of the American Steel & Wire Co. at Duluth and Worcester, Mass., and the American Bridge Co. at Pencoyd, Pa., plus scattered plants of American Steel & Wire at Allentown, Pa., New Haven, Conn., and Trenton, N. J., and of the American Bridge Co. at Elmira, N. Y., Minneapolis, Pencoyd and Trenton. The map seems to confirm Pittsburgh as the headquarters from the standpoint of individual plants.

that time 24,500,000 tons—4,500,000 more than considered necessary under the most favorable conditions of consumption.

Current opinion in the ore industry is that the shipping season will not begin until about May 1. Last year the first tonnage was moved on April 29.

Then there was a rapid increase in the number of vessels in commission. Prospects at first appeared much better than they do today. Last year the prospects were deflated about the middle of the year. The opposite may prove true this year—with better shipments in the last half than in the first.

Needs Not Excessive

At the outset the only needs appear to be those for rounding out mixtures. The fact a consumer has 2,000,000 tons of iron ore on hand does not mean he can use it all before obtaining additional tonnage. He must keep it balanced as to analysis to meet varying requirements.

Insurance goes in effect April 15, and some vessels may be out by that time.

The latest information coming from ship news reporters at Sault Ste. Marie is that upper rivers and locks will be open some time between April 10 and 15. The Duluth-Superior harbor is filled with thick ice.

Coal Stocks Sufficient

Just as important as iron ore in the movement of vessels is the demand for coal in the upper lake regions. Coal stocks there are considerably larger than they were last year at this time. Hence, if a strike should be declared in the bituminous coal fields early in April, as now seems probable, it would not have any appreciable effect for a month or more, according to shippers.

If the strike continued for more than a month it undoubtedly would retard lake shipping. When lower-lake coal stocks were moved northward, fewer vessels would be operated, this also tending to concentrate shipments in the last half of the year.

Jewett Seeks Index Fund

Dr. Frank B. Jewett, president, Bell Telephone Laboratories Inc. and vice president, American Telephone & Telegraph Co., New York, has become national chairman of a campaign to raise a working capital fund of $161,000 for Engineering Index Inc., 25 West Forty-third street, New York.

Collins P. Bliss is president of the Index, which was discontinued as an activity of the A. S. M. E. a year ago and is now itself attempting to discontinue this service to industry.

Activities of Steel Users and Makers

NATIONAL STEEL CORP., Grant building, Pittsburgh, has consolidated New England offices of its subsidiaries at 1001 Statler building, Boston. S. B. Burke is in charge of sales for New England for Hanna Furnace Corp., W. E. Snellgrove for Weirton Steel Co., and A. G. Beal for Great Lakes Steel Corp.

♦ ♦ ♦

VanDoren & Rideout, Toledo, O., industrial designers, have opened an office at 1112 Merchandise Mart, Chicago, to serve clients in that area.

♦ ♦ ♦

Ironton Fire Brick Co., Ironton, O., manufacturer of refractories, has appointed Neville & Cleary Inc., Atlanta, Ga., its exclusive sales representative for Tennessee, North Carolina, South Carolina, Alabama, Georgia and Florida.

♦ ♦ ♦

National Alloy Steel Co., Blawknox, Pa., has appointed Horace T. Potts Co., East Erie avenue and D street, Philadelphia, district representative for sale of heat, corrosion and abrasion resisting castings in Philadelphia and Baltimore territory.

♦ ♦ ♦

Thomas A. Edison Inc., West Orange, N. J., has formed an engineering committee to co-ordinate research work and engineering projects of the Edison industries. E. D. Martin, vice president of Thomas A. Edison Inc., will be chairman of the committee.

♦ ♦ ♦

Cedarburg Mfg. Co., Cedarburg, Wis., Thorwald Hansen, Milwaukee, president and general manager, has placed in production a light-weight outboard motor largely of alloy steel instead of aluminum. Orders already booked promise sales of 10,000 for this year (see page 40).

♦ ♦ ♦

Gould Coupler Co. and the Symington Co., both at 250 Park avenue, New York, will be reorganized into one corporation, if a plan filed with the federal court is approved. Bonds and stock in the old companies would be exchanged for stock in the new, under the proposed plan.

♦ ♦ ♦

R-S Products Corp., Philadelphia, which took over the organization and control of all products of Ryan, Scully & Co. two years ago, has increased its line of standard furnace products, gas and oil burners control equipment and other lines through additions to machine shop and plant facilities. All equipment is now manufactured under direct factory supervision. The company has appointed Claud S. Gordon Co., 708 West Madison street, Chicago, with branch offices in Cleveland and Indianapolis, as representative for all Ryan products. John R. Gearhart Co., 600 Fallon street, Oakland, Calif., has been appointed representative in the San Francisco territory.

♦ ♦ ♦

Ruemelin Mfg. Co., Milwaukee, has moved into its own building, 3850 North Palmer street. The new plant provides more floor space, more head room and modern facilities for production of its line of foundry blasting equipment, dust filters, exhaust fans, cabinets and room type equipment.

♦ ♦ ♦

Graver Tank & Mfg. Corp., East Chicago, Ind., has opened a sales office in New York City at 424 Madison avenue, with Sam D. Barr as manager. Mr. Barr has been associated with the company for the past four years, recently having been manager of sales in the Philadelphia district and at one time was associated with the Kansas City office.

♦ ♦ ♦

Coppus Engineering Corp., Worcester, Mass., has started manufacture of unit filters, dry type automatic self-cleaning filters and filters for compressors and internal combustion engines under the name Coppus air filters. A license agreement under which it has been manufacturing filters the past three years has been canceled.

♦ ♦ ♦

C. J. Tagliabue Mfg. Co., Brooklyn, N. Y., has opened a branch factory at 1916 Jackson street, Dallas, Tex., supplanting the office at Shreveport, La., which has been closed. The new plant will do repair work, with special attention to emergency orders and stocks of standardized products will be carried. A. G. Koenig, southwestern district manager, will be in charge.

♦ ♦ ♦

George D. Miller Co., 2168 West 100th street, Cleveland, has been appointed exclusive representative in the Cleveland district for W. F. & John Barnes Co., Rockford, Ill., manufacturer of multiple spindle hydraulic feed drilling, tapping and boring machines, milling machines, hydraulic feed lathes and self-contained square ram hydraulic drill units.

♦ ♦ ♦

Wanderer-Werke of Winklhofer & Jaenicke A. G., Schonau-Chemnitz, Germany, large manufacturer of milling machines and other tools and equipment, marked the fiftieth anniversary of its founding Feb. 15. In connection with this occasion the company issued a handsome booklet telling the history of the company and development of its various lines of products.

EDITORIAL

Burden of Extending NIRA Rests with Industry

EVERY industrial concern has cause for alarm over the manner in which congress is approaching its task of dealing with the problem of extending the national industrial recovery act. Judging from what has transpired during the past two weeks, the senate finance committee, which has the matter in hand, seems to be more than willing that NIRA become a political football.

This is unfortunate, because if the fate of the act is to be determined along lines of political expediency, the result will be disastrous to the public interest, to employes and to industry.

The reason for this is obvious to those who have watched the trend of political opinion in regard to NIRA. When the act was passed and for some months thereafter, its espousal by senators and representatives was a powerful asset politically. Today it is safe to say that NIRA has become a definite liability in the minds of a considerable number of congressmen in both houses. This being true, it is not surprising that the Roosevelt administration is noticeably less emphatic in its support of legislation for extending the act. Nor is it strange that the senate committee is tacitly encouraging all comers to throw brickbats at NIRA.

Many Congressmen Are Unable To Interpret Criticism Against NIRA Intelligently

In these circumstances, industry is at a serious disadvantage in attempting to protect its rights. Industry's arguments do not appeal strongly to the political mind—which today is in a highly emotional state. Moreover, many congressmen are incapable of interpreting the true significance of the outcry against NIRA. Unfortunately scores of them think that any criticism of the act on any score justifies them in assailing the price provisions of the codes. Again, numerous congressmen seem to be unaware of the fact that codes in some industries have functioned quite satisfactorily, with unquestioned benefits to all interests concerned, while in other industries codification has failed miserably.

The preponderance of opinion among the code members of most of the basic materials industries and some of the equipment industries seems to favor extension of NIRA, providing it is continued in workable form. The steel code and the codes of some of the kindred industries, as for instance steel foundries, machine tools, etc., have resulted in certain well defined benefits. These industries have gone to great lengths to perfect efficient organizations for administering codes. They have adjusted their operations to accord with the intricate procedure specified. Their code machinery represents a great investment of time, effort and money.

If congress fails to extend NIRA, or revamps it so drastically that its benefits are destroyed, the industries which have operated satisfactorily under codes will suffer a serious setback. In this connection it is well to recall the disconcerting recession in business which occurred in 1933 while industry was trying feverishly to adapt itself to NIRA. It is no exaggeration to say that chaotic conditions continued for approximately five months before producers and consumers could adjust their affairs to the new rules. To change back probably would entail an equally violent period of uncertainty and confusion.

Senate Committee Has Heard Vociferous Radicals; Industry Should Voice Its Stand

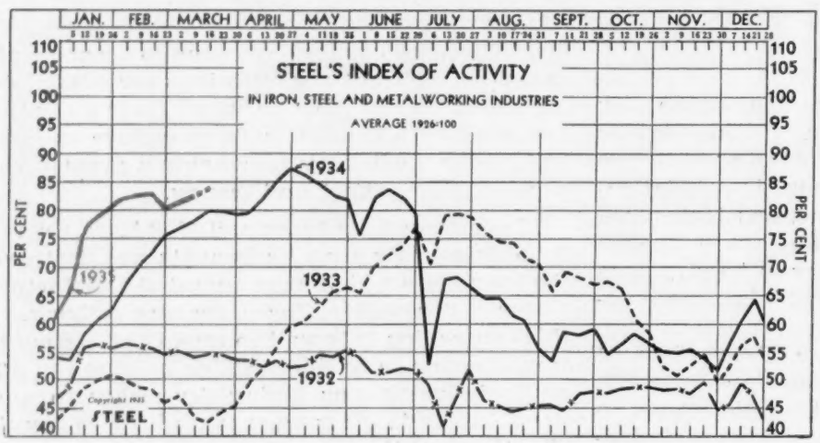
Every branch of industry has so much at stake that its authorized representatives should lose no time in voicing their opinions before the senate finance committee. Thus far most of the evidence filed with the committee has emanated from vociferous radicals or from politicians who rise perennially to shout against monopoly. The voice of industry—and particularly that of branches of industry which have taken their codes seriously—has not been lifted sufficiently to be heard above the din of the Darrows, Longs, Borahs and Nyes.

Professional labor unions, which maintain one of the strongest and smoothest functioning lobbies in Washington, are on record as demanding the extension of the recovery act. Pressure from this source probably will be strong enough to force a continuation of NIRA beyond June 16. Obviously, however, the unionist lobby will concern itself chiefly with the labor provisions of the act. It will care little whether or not the act is satisfactory to others, providing its own interests are served.

In the final analysis, the burden of responsibility for extending NIRA in workable form falls upon the shoulders of the industries which desire to have their codes continued. Theirs is a difficult, but not necessarily a hopeless, task.

THE INDUSTRIAL DIAL

Published in the last issue of each month as part of
The Business Trend Section of STEEL
Copyright 1935 by Penton Publishing Co.



STEEL's *index of activity in the iron, steel and metalworking industries gained* 1.8 *points to* 83.8 *in the week ending March* 16:

Week ending	1935	1934	1933	1932
Jan. 19	78.1	60.9	49.8	56.2
Jan. 26	79.5	62.3	50.8	55.8
Feb. 2	81.8	66.9	49.9	56.2
Feb. 9	82.7	70.7	48.7	56.0
Feb. 16	82.8	72.4	48.3	54.4
Feb. 23	80.5	75.5	46.0	55.1
Mar. 2	81.1	78.8	47.4	54.1
Mar. 9	82.0†	78.6	43.4	54.8
Mar. 16	83.8*	79.9	42.7	54.4

†Revised. *Preliminary.

Bears Ignore Basic Strength of Business Situation

TO ASCERTAIN the changes that have taken place in the business situation during the past month, it is necessary to look beyond the ordinary records.

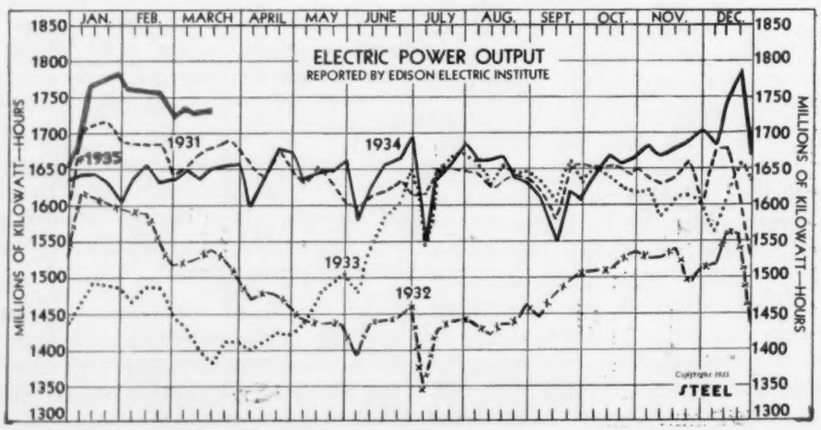
From the standpoint of productive activity, the pace of industry has fluctuated within restricted limits. The rate of steelworks operation has dropped from a peak of 54 per cent to about 47 per cent. Revenue freight traffic and electric power output—two barometers of wide scope—have remained remarkably steady, with only a slight tendency toward weakness. Automobile production has mounted rapidly from around 75,000 to approximately 100,000 units weekly.

The net result of the play of these factors, as shown by STEEL's index of activity in the iron, steel and metalworking industries, is a trend line which has changed only slightly during the past four weeks. In fact, the latest figure—for the week ending March 16—is the highest recorded since last May. Under present conditions no marked change in the index can be expected before the second or third week of April.

Its course beyond that time is problematic. An important forecaster of industrial activity is the trend of orders. Unfortunately the formal statistics of new orders are compiled on a monthly basis, and therefore are not available in time to be of first importance in predicting the future. However a study of the indexes of new orders of machine tools, foundry equipment, fabricated structural steel, and other products shows that in most cases the peak of new bookings was

Million Kw.-Hours

1935	
Mar. 16	1,728
Mar. 9	1,724
Mar. 2	1,734
Feb. 23	1,728
Feb. 16	1,760
Feb. 9	1,763
Feb. 2	1,762
Jan. 26	1,781
Jan. 19	1,778
Jan. 12	1,772
Jan. 5	1,668
1934	
Dec. 29	1,650
Dec. 22	1,787
Dec. 15	1,767
Dec. 8	1,748
Dec. 1	1,683



Million Kw.-Hours

1934	
Mar. 17	1,650
Mar. 10	1,647
Mar. 3	1,658
Feb. 24	1,646
Feb. 17	1,640
Feb. 10	1,651
Feb. 3	1,636
Jan. 27	1,610
Jan. 20	1,624
Jan. 13	1,646
Jan. 6	1,563
1933	
Dec. 30	1,539
Dec. 23	1,656
Dec. 16	1,644
Dec. 9	1,619
Dec. 2	1,553

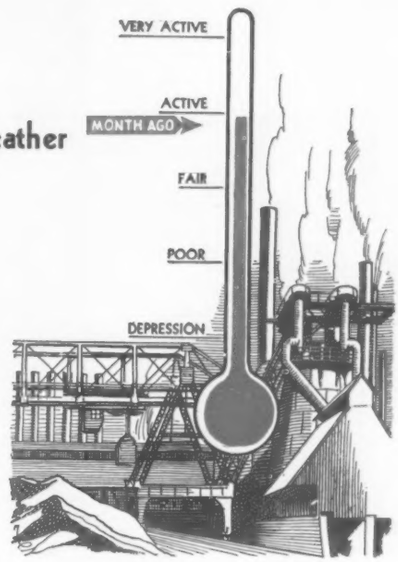
passed late in January or in February. In the case of automobiles, agricultural implements and certain household articles such as refrigerators the trend of orders still is upward.

A further clue, which is more timely, is found in the current market reports. These show a recession in inquiries and orders for many items of basic materials and industrial equipment. It is significant that the revival of plant and equipment rehabilitation work, which brought encouragement to industry several weeks ago, is somewhat less noticeable today.

Against these unfavorable signs are a number of compensating factors. The activity in the great field of unclassified industries—that section which is usually designated as miscellaneous—has continued steady. The financial position of the great majority of companies is much stronger than it was a year ago. The cumulative effect of profits is coming to the rescue of many concerns which have stood a long siege of red ink. During recent weeks relief rolls, which had been mounting steadily and alarmingly, have leveled off and in some localities have turned downward.

The foundation for industrial recovery is broader and stronger than at any time since the low point of 1932. This basic fact should weigh more heavily than the intangible implications of the present mess in Washington.

Industrial Weather



TREND:

Steady

Where Business Stands

Monthly Average, 1934—100

	Feb., 1935	Jan., 1935	Feb., 1934
Steel Ingot Output	140.7	129.2	111.9
Pig Iron Output	131.7	108.8	103.6
Freight Movement	98.2	91.7	97.5
Building Construction	.....	88.5	64.3
Automobile Output	147.3	128.4	77.0
Wholesale Prices	105.5	105.4	99.8

The Barometer of Business

Industrial Indicators

	Feb., 1935	Jan., 1935	Feb., 1934
Pig iron output (daily average, tons)	57,675	47,692	45,385
Machine Tool Index	61.5	61.3	58.2
Finished Steel shipments (tons)	583,137	534,055	385,500
Ingot output (daily average, tons)	114,255	104,969	92,232
Dodge building awards in 37 states (sq. ft.)	.....	11,245,100	8,176,300
Automobile output	*355,350	303,372	243,955
Coal output (tons)	34,423,000	36,393,000	31,950,000
Business failures, number	1,005	1,184	1,049
Business failures, liabilities	$18,737,657	$18,823,697	$19,444,718
Cement production (Bbls.)	.....	3,202,000	4,168,000
Cotton consumption (bales)	.....	546,787	477,890
Car loadings (weekly av.)	581,400	542,618	577,217

*Estimate.

Foreign Trade

	Feb., 1935	Jan., 1935	Feb., 1934
Exports	.....	$176,223,000	$159,671,000
Imports	.....	$167,006,000	$125,292,000
Gold exports	.....	$363,000	$51,000,000
Gold imports	.....	$149,755,000	$452,622,000

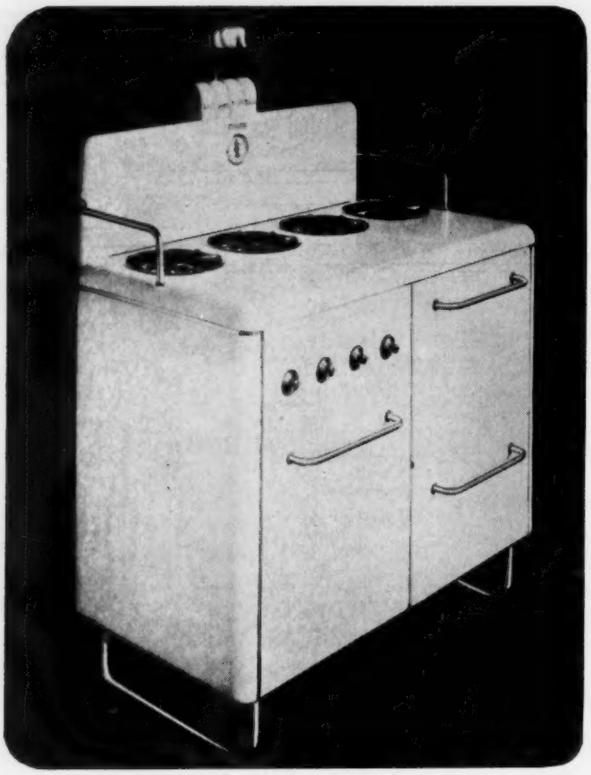
Financial Indicators

	Feb., 1935	Jan., 1935	Feb., 1934
25 Industrial stocks	$145.69	$145.88	$148.33
25 Rail stocks	$25.76	$27.78	$41.02
40 Bonds	$82.51	$82.98	$80.59
Bank clearings (000 omitted)	$19,040,988	$21,268,788	$19,036,698
Commercial paper rate, New York (per cent)	1	1	1½
*Commercial loans (000 omitted)	$7,598,000	$7,591,000	$4,665,000
Federal Reserve ratio (per cent)	72.4	71.8	66.3
†Railroad earnings	$21,348,557	$38,729,833	$30,931,205
Stock sales, New York stock exchange	14,404,225	19,409,752	56,834,010
Bond sales, par value	$224,268,000	$332,540,800	$384,503,700

*Leading member banks Federal Reserve System.
†January, December and January, respectively.

Commodity Prices

	Feb., 1935	Jan., 1935	Feb., 1934	Monthly av., 1913
STEEL's composite average of 25 iron and steel prices	$32.54	$32.58	$32.42	$26.32
Bradstreet's index	$9.79	$9.78	$9.26	$9.21
Wheat, cash (bushel)	$1.13	$1.13	$1.07	92c
Corn, cash (bushel)	$1.02	$1.04	66c	51c
Petroleum, crude (Bbl.)	98c	98c	98c	$2.50



Streamlined gas range has welded steel angle frame and is covered with steel sheets finished in porcelain enamel. Stainless steel trim and chrome-plated tubular legs and handles enhance appearance

ALL-STEEL GAS RANGE

Unusual Departures Made in Design, Choice of Materials, Construction Methods and Finish

BY E. C. KREUTZBERG
Engineering Editor, STEEL

REVERSING the usual procedure, Tinnerman Stove & Range Co., Cleveland, has developed a new gas range which is built from the inside out rather than from the outside in. Aside from the legs, the visible members are designed for permanent appearance and are not relied on for any structural values. The outside surfaces are placed on the range after it has been completed. Not being subjected to any strains, and being insulated against the heat from the gas flames, the outside members of this new range are intended permanently to resist warpage and distortion in service.

Covered with panels of streamlined design and porcelain enameled in any desired color, provided with ornate accessories such as stainless steel trim and chromium plated tubular legs and handles, and with a striking arrangement of all parts, the new range is distinctive for its beauty.

It has other claims to distinction. It is equipped with burners of a new type which do not clog from boilovers. Because the four burners have been placed in a straight line across the rear of the cooking top, large kettles may be placed over one or two of them without restricting the use of the others. This arrangement also eliminates the necessity of holding the arm over front burners in order to reach those at the rear.

A new type of circular rotary broiler grille has been developed for this range. It is round and is mounted like the seat of a piano stool so that it can be raised or lowered rapidly by rotating it in either direction. In addition to the usual thermostat for controlling oven temperatures, the new range is equipped with a timer which automatically rings an alarm bell after a predetermined length of time has elapsed.

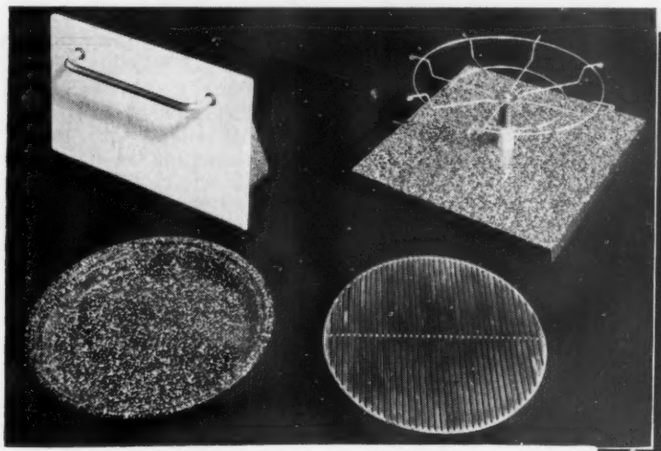
An unusual feature of the new range is that it is built of steel throughout. The only castings employed are the burners, burner holders and several accessory parts. This construction results from the company's previous experience with stoves made of both rolled steel sheet panels and partitions with cast iron frames. Under the porcelain enameling temperatures the cast iron warped more than the rolled steel and it was difficult to get color matches.

In abandoning the use of castings for structural parts, the company had to design steel members which would not weave or warp. This was accomplished by the use of front and base frames fabricated of steel angles and of partitions made from rolled steel sheets. In some cases the sheet partitions are stiffened by simply flanging them at the sides. In others they are embossed. Some of them, after embossing, are reinforced by stiffening sheets attached by spot welding. Sheet members which are not visible or subjected to heat are given a black japan finish, the porcelain enamel finish being reserved for external panels and the panels which are used to line the interior of the oven and broiling compart-

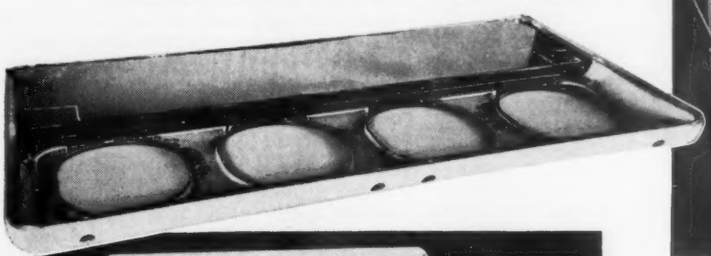
ments. These oven and broiler compartment panels, incidentally, are backed by 1-inch sheet of rockwool insulation.

Methods of construction employed are reflected in the design of the basic body of the range. First the front and base frames are fabricated by punching, notching, forming and arc welding steel angles. Five No. 24 gage, steel sheets, finished in black japan, are placed in these frames to form the back, end, top and middle partitions. Into this assembly are placed insulation blocks, after which the porcelain enameled steel linings are placed.

A sub-assembled manifold unit is installed and the broiler drawer bottom bolted in. The broiler drawer bottom is of No. 18 gage sheet steel.



Broiler drawer parts (above), including broiler pan, grille, tray and wire nest mounted on screw



Rotary broiler pan (above) is mounted on a threaded steel bar and may be raised or lowered quickly by rotation. Outside members of the range are not relied on for structural strength. A welded steel angle frame (below), with sheet partitions, forms a skeleton of high rigidity

Center inset shows interior view of top panel, with steel angle reinforcement. Lower inset shows cast burner with forged brass caps. Illustration between shows interior of range, utility racks, controls and oven arrangement

It is provided on both sides with U-shaped flanges; to these flanges the front ball bearing rollers are riveted. The broiler drawer itself is of box design and is formed with No. 20 gage sheet steel; both sides are topped with L-shaped flanges and the corners are brazed to provide strength and rigidity. The back ball bearing rollers are riveted at the rear of the two sides. The porcelain enameled inner drawer panel is bolted to the bottom and rigidly supported by two porcelain enameled steel side brackets.

A separate bottom of porcelain enameled steel which supports the rotary broiler fits into the No. 18 gage bottom, thus making the rotary broiler easily removable for cleaning or for allowing large roasting pans to be placed in the broiler compartment.

Construction of the Broiler

The broiler pan is 15 inches in diameter and of the basin type. It is formed from No. 20 gage sheet steel and plated with copper, nickel and chromium. It rests in a nest made of No. 7 steel wires which are spot welded to the bottom of a steel washer. After forming, this assembly is hot tin dipped. The washer is attached, by means of a cap screw, to the top of a threaded steel bar machined from 1-inch cold drawn rounds. The washer is depressed so as to lock in a slot in the top of the threaded bar. The threaded steel bar then is placed in the cast iron housing which has been bolted to the removable porcelain enameled broiler drawer bottom.

Inasmuch as the broiling temperatures range between 600 and 800 degrees Fahr., the housing is not threaded, since continued friction at these temperatures would have the effect of wearing out the threads on both parts. Instead, the housing simply is drilled and reamed, after which a case-hardened set screw is passed through a drilled and tapped hole in the wall at the top of the housing. This set screw engages the thread in the threaded steel bar, providing for the raising and lowering of the latter. This use of a set screw instead of a thread in the female member not only reduces the amount of wear by friction at high temperatures, but also is cheaper than an all threaded joint.

In addition to permitting the broiler to be adjusted instantaneously to any desired distance from the gas flame, this rotary or "piano stool" type of broiler has safety value. If the meat is too close and starts to burn, it may be withdrawn from the flame by merely giving the rotary broiler a sharp twirl. A safety factor also is provided by spacing the grids on the grille 1/16-inch apart, an opening too small to permit the flame from penetrating and igniting the drippings in the broiling pan. The grille is made of cold drawn flat wires, ¼-inch wide, which are spot welded to a circle made of No. 7 gage steel wire and reinforced by a wire cross piece spot welded to opposite points on the circle. The grille is finished by applying a tampico brush and then placing a coat of chromium plating directly on the steel.

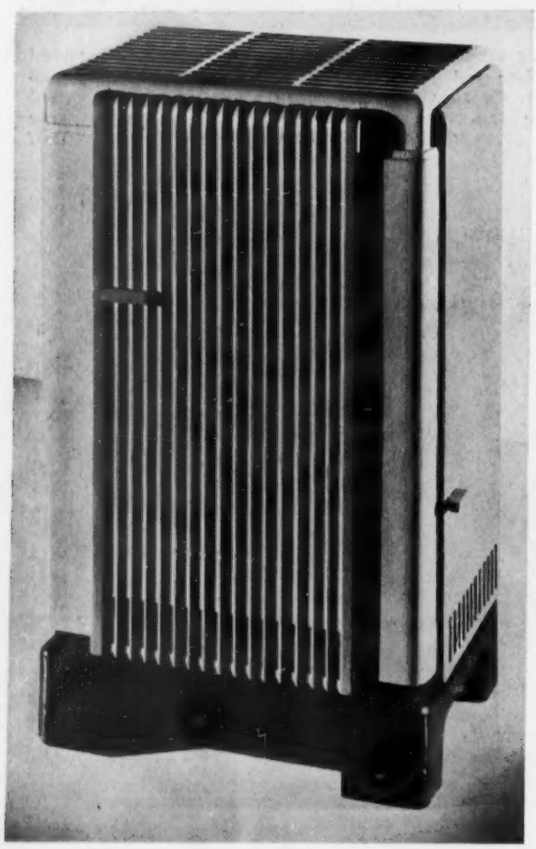
Embossed and reinforced with a stiffening sheet, the oven door is rigid and tight fitting to prevent heat leakage. It is mounted on set screws which engage holes in the upright members of the front frame of the range. It is provided with circular hinges stamped from No. 11 gage steel sheets. These hinges are notched at the ends to provide stops so as to hold the oven door in the horizontal position when open. They are held in tension by coiled steel springs anchored to the bottom frame and between the inner and outer partitions, the insulating rock-wool being cut away to provide room. These springs serve the usual purpose of keeping the oven door tightly closed when not in the open position.

Details of Utility Cabinet

The door of the utility cabinet is of the same construction as the oven doors, being embossed and further reinforced with a perforated stiffening sheet spot welded to the back of the door. It is of No. 20 gage steel sheet. This door is mounted on a full length piano type hinge made of cold rolled strip steel and copper, nickel and chromium plated. The door is bolted to the hinge plate, by means of special speednuts manufactured by this company, leaving a vertical space about ⅛-inch between the door and the hinge. In attaching the hinge to the side frame by means of machine screws, brass ferrules are inserted in order to provide a similar vertical space on the other side of the hinge. These spaces are provided for mounting the porcelain enameled outside door panel, and the porcelain enameled end panel.

The manifold gas burners and accessories are arranged beforehand in a sub assembly mounted on a support strip made of ⅛ x 2½-inch steel flats. The assembly consists of steel manifold pipe through which gas is conveyed from the meter, four burners and burner brackets, valves and handles, together with thermostatic controls. Brass valves are used to guard against corrosion and leakage; these are regulated by steel rods equipped with bakelite handles. Inasmuch as the burners are more remote from the valves than usually is the case, and because the support-

Stove Goes Modern



CHANGE IN DESIGN BRINGS INCREASED SALES: New stove, designed by Wilbur Henry Adams and Associates, industrial designers, Cleveland, for Kalamazoo Stove Co., Kalamazoo, Mich., fits that company's production facilities and is extremely good looking. In this new model, the modern, vertical fins give improved radiation, a section of the fins becomes the door and the hinges are recessed

ing strip provides a sufficiently rigid mounting, flexible copper tubing is used to bring the gas from the valves to the burners. Steel tubing, however, is used for the pilot lights in order to give the latter a rigid base. The burners are of cast iron, of a new type, and equipped with brass forged burner caps of a new type. These are of mushroom shape, with the gas ports on the side, so that liquids from overflowing kettles cannot clog them.

Three porcelain enameled steel panels are placed on the front of the range after the latter has been constructed, one over the broiler compartment door, another over the oven door and the third over the utility compartment door, with insulation blocks placed inside the oven and broiler panels. They are flanged in order that they may be fitted over these doors. All three panels have holes through which the handles are attached, and the utility compartment door panel has four openings through which the bakelite handles of the gas valve regulators protrude.

Attachments Protect Porcelain

These outer panels are fastened to the inner panels by means of this company's speednuts which speed the assembly and hold the parts under spring tension. The use of these speednuts also protects the porcelain enameled surfaces against chipping.

An ingenious arrangement is used in attaching the tubular handles. The handles are formed of seamless steel tubing, copper, nickel and chromium plated. Into each end is placed a plug which is held in place by centerpunching the outside of the tube so that the indentation in the metal is forced into a groove in the plug, thus locking the latter in place. The handles then are fastened by machine bolts screwed into the ends of the plugs. The front surface of the stove is completed by covering the center vertical upright of the steel angle frame with a stainless steel strip rolled into the form of a U-shaped channel.

Side panels are formed of No. 20 gage steel sheets with edges curved to a radius of 1½ inches, thus producing a streamline effect. They are held in grooves at the front by means of their flanged edges and are bolted to the rear partition of the range.

Of particular interest is the top finishing panel which is a single stamping made of No. 18 gage steel sheet, porcelain enameled. It has round corners of 1½-inch radius and edges of the same radius, thus eliminating the usual box edges with welded corners. The rear portion, containing the openings for the four burners, is embossed, not only for stiffness but also to take up surplus metal and produce a better looking stamping. The front portion is made flat, to serve the purpose of a table, and is insulated for coolness by a sheet of rockwool held in place by a thin black japanned sheet. The latter is locked into a length of steel angle along the center line of the top; the main purpose of this angle is to stiffen the top and prevent it from flexing and weaving and to help it sustain the weight of the heaviest kettles. This steel angle is held by speed nuts slipped into clips spot welded to the top. This method of construction has produced a top on which a man may walk without producing any deformation.

In the burner holes in the top plate are placed trays known as aeration plates. The original mixture of air and gas is generated in the burner castings in the usual way by means of stamped steel air shutters. The aeration plates cover the burner castings, so that only the brass burner ports protrude through them, four to each aeration plate; they provide for a proper flow of the secondary air that comes up around the burner ports. These aeration plates are steel stampings, embossed for rigidity and appearance, and finished in porcelain enamel. The top proper is finished by placing removable trays beneath the burners for the purpose of catching drippings. These are also steel stampings, embossed and porcelain enameled. For holding kettles, cast iron grilles are placed in the burner holes of the top.

The splasher plate also is a steel stamping, designed in keeping with the rest of the exterior and porcelain enameled. To its back is bolted a welded sheet steel, black japanned bracket which supports salt, pepper and flour shakers, as well as an electric lamp shade which illuminates the top of the range. In an opening in the center of the splasher is a timer dial which may be set so that after a kettle has been over the flame for a predetermined length of time, an alarm bell will ring. The splasher is reinforced by tubular arms, finished and attached in the same manner as the door handles.

Trim of Stainless Steel

Care is taken that porcelain enameled surfaces will not rub against each other. Separating the top and the side panels are T-shaped stainless steel shapes, the flat side serving as trim and the leg as a shim between the top and side panels. The stainless steel, during assembly, is held by tabs and later is held permanently in place when the top is bolted to the range.

No. 18 seamless steel tubes, formed like the handles, and copper, nickel and chromium plated, serve as the legs. Steel plugs in the ends of these legs are held by indentations in the tubing. Forged steel brackets are bolted to the bottom members of the steel angle frames. The brackets are provided with set screws which are tightened against the tubular legs to hold them firmly in place; the plugs serve the purpose of preventing the tubes from crushing under the pressure of the set screws. By means of these set screws each leg may be moved up or down to the extent of ½-inch at each corner, thus providing compensation for any irregularities in the floor level.

(To be concluded)

Attempts to use glass in place of metal in a metal spraying machine have not been satisfactory in all cases. Silica sand dust can be fused and deposited on metals, but it is considered a somewhat hazardous operation because of explosions occurring from some obscure cause.

Beer Cans Arrive

CANNED BEER BECOMES A REALITY: Beer and ale made by Krueger Brewing Co., Newark, N. J., are being marketed in the new "keg-lined", tin plate cans developed for this purpose by American Can Co. For the time being, sales in these containers are restricted to the city of Richmond, Va., where the reception of the new package is being watched carefully. Reports so far indicate beer in the new container is gaining in popularity, indicating that the use of this package shortly may spread to other sections of the country. With the cans are furnished special steel openers which, at one stroke, cut a triangular opening in the top

Plant Layout Revamped, Installed for Assembly of

BY JOHN M. BONBRIGHT

ADOPTION of numerous machines of entirely new design, built specially for operations peculiar to the manufacture and assembly of enclosed-type individual front wheel suspension units, and a thorough-going revision of the plant layout to insure orderly progress of component parts from raw material to finished units, have been combined to facilitate production and to improve the product at the Chevrolet gear and axle plant, Detroit.

Chevrolet's 1935 knee-action units are virtually unchanged from the 1934 models. Slight modifications in the size of the bearings and of wheel supporting members have been made, but a year's use disclosed no need for any departure from the principles and construction of the original design (STEEL, June 25, 1934).

Use of machines specially designed for the job is claimed to have bettered the product at almost every stage of its manufacture, while a complete system of gaging in progressive steps stops defective work at whatever stage of completion it has reached, so that no operations are performed on parts that will have to be rejected later.

Production Units Consolidated

Of equal importance to the refining of the product, from the point of view of the manufacturer who looks for efficiency and economy in production, is the effect of revision of the plant layout, which has brought all manufacturing operations (except forging and coil spring manufacture) under one roof. All machines have been rearranged in correct sequence of operations, and each component part arrives at the right time and in the right quantity at the point where it is to be assembled with other parts. Thus, the stamping, drawing and forming operations required prior to welding the front and rear halves of the knee-action housing, and the upper and lower halves of the kingpin support (the crossmember that supplants the front axle), and the welding operations as well, all of which formerly were handled in a distant building, are now consolidated with subsequent manufacturing and assembling operations.

An unusually comprehensive system of conveyors, totaling 10,865 feet in length, has been installed to bring about efficient handling of parts. Power-driven conveyors are supplemented with gravity chutes between machines that comprise a series of equally timed steps of manufacture.

Thus, for each of the five presses by which blanks for housings or kingpin supports are formed, there is a separate battery of drawing and forming presses, keeping pace with one another, served by gravity chutes into which the work is ejected from each machine, to slide to the next machine. At the ends of the parallel batteries, the work is placed on conveyors which carry it to the section of the plant in which the next series of operations is to be performed.

Probably the greatest improvement in the conveyor system as a whole is the adoption of two separate lines in parallel, one devoted exclusively to right side, the other to left side, parts and assemblies—the two knee-action units for each car, of course, being formed in reverse image of each other, and requiring many parts so reversed in shape and in the location of attachments, machined faces, perforations and the like. The system of dual conveyors extends from the beginning of the series of operations all the way to the final assembly line. By this method, the operators of machines equipped with dies or jigs for work on only one particular half of the housing now receive a constant supply of parts, and no longer are required to select them from among parts they cannot handle.

Emphasis on Accuracy

The kingpin support for 1935 suspension is heavier and more rigid, being of deeper section and including additional welded reinforcements. All dies in use this year are new, and many additional machining operations are performed for accurate shaping of the support and to provide a more securely and more accurately positioned assembly in the chassis. For example, all holes formerly punched are now drilled in jigs on multiple drills, while the surfaces where the support contacts with the chassis frame are now faced and located in the same plane by specially developed external broaching machines. Correct alignment of the support in the chassis, upon which depends front wheel alignment, is assured by these improvements.

Housings are formed, Fig. 1, from 5/32-inch sheet steel. Four sets of dies are required—a set for each half (front and rear) for the left side unit, and a set in reverse shape for the right side unit. Preliminary operations, Fig. 2, are blank and draw, reduce, first form, finish form and trim. The pieces then are sized in a 300-ton coining press, which squares up and straightens the edges for accurate alignment and close contact between the halves in the welders. Liberal use of coining presses at this and subsequent steps of manufacture is credited with much of the improvement over last year's work. Coining presses are used wherever possible to insure exact shape and size in the parts, for accuracy either in welding or in the alignment of bushings, brackets and shock absorbers, to be attached later.

New Welders Are Installed

The first welding operation is to affix the small inside shock absorber reinforcement in the front half of the housing, after which the face on which the two shock absorbers are to be seated is trued up in a coining press, then smoothed by grinding.

Specially designed welders are used to join the two halves of the housing, eight of these machines having been installed. The welder, powered by a 5-horsepower motor, is equippped with a variable-speed control. The operator inserts the two halves in horizontal position, the open ends toward the front of the machine, then closes the flash guards and pushes the starter button.

The sequence and timing of operations are entirely automatic. The movable head is advanced by adjustable cam action, which first brings the edges of the parts in full contact and then regulates the pressure on the edges during the welding, to assure correct finished size. The arc is formed entirely around the two sections—a length of 26½ inches—by

Special Machines

Knee-Action Units

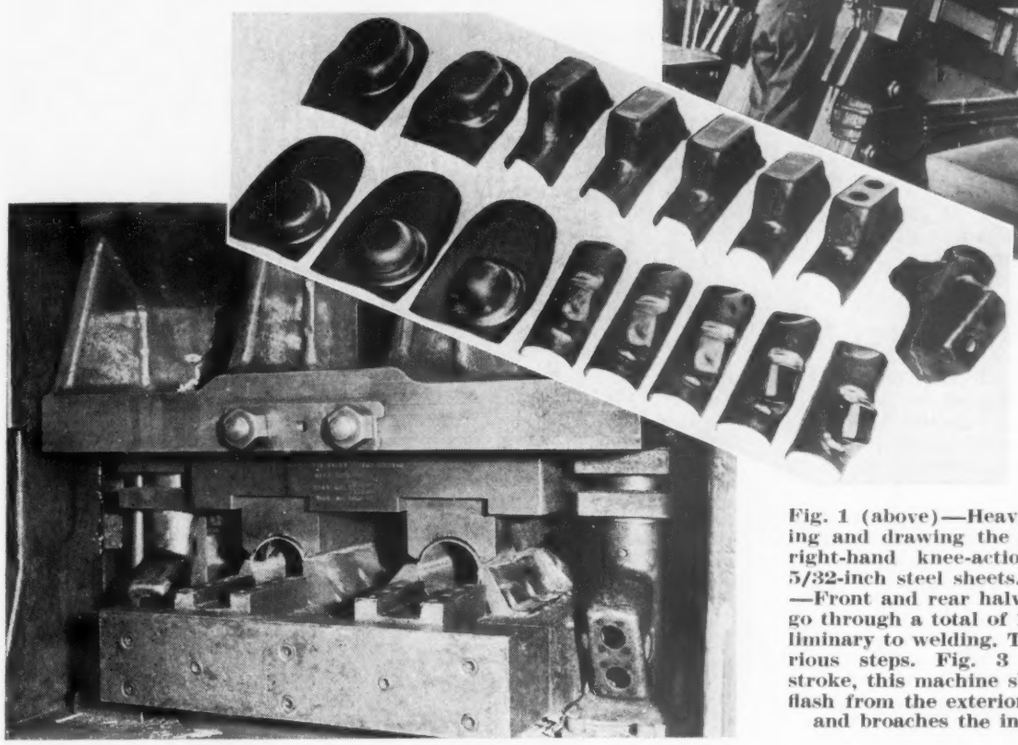


Fig. 1 (above)—Heavy press for blanking and drawing the front half of the right-hand knee-action housing from 5/32-inch steel sheets. Fig. 2 (center)—Front and rear halves of the housing go through a total of 15 operations preliminary to welding. This shows the various steps. Fig. 3 (left)—At each stroke, this machine shears the welding flash from the exterior of two housings and broaches the interior of a pair

a current of 440 volts, supplying 900-amperes flash and increasing to 2000 amperes. The flash is trimmed off in a vertical press, Fig. 3, which shears the excess metal from the exterior of a pair of housings in horizontal dies, at the same time broaching the welded seam inside two other housings in vertical fixtures.

A new method of removing fused particles or sparks from inside the housings makes use of circular wire brushes, slightly larger in diameter than the cylinders, running at high speed on horizontal arbors. Two coining operations follow, one to flatten the circular bottom of the cylinder to insure proper fit of the radius arm attachment, and another to insure roundness of the open end for boring and threading.

Steering knuckles are welded to the extruded projections on the housing in a battery of electric welders installed last year but now equipped with new fixtures and improved in operation. The housing then is subjected to its first under-water test, which utilizes air under 15 pounds pressure to reveal leaks.

Vibrated by Hammer Blows

A new test follows, the housing being inverted over an upright with the steering knuckle against a block of live rubber, then rapidly vibrated by blows from a 40-pound pneumatic hammer. This test not only reveals faulty welding, but aids greatly in cleaning by shaking free any remaining spatterings from the welder.

Rearrangement of the conveyor line has brought improved results in the welding of main shaft bearing bosses to the housings. An arbor carrying two bosses is inserted through the housing, and the entire assembly then rotates in the electric welder which makes a 360-degree weld around each bushing. The conveyor line bringing the work to the welders now extends some distance beyond the machines and doubles back to return to them. The arbor is allowed to remain in the housings loaded on the conveyor, and serves to hold the bushings in alignment while the parts are air cooled. As they repass the welders, the arbors are withdrawn from the housings.

After another inspection, the housings pass through a normalizing furnace, being held at 900 degrees Fahr. for 2 hours. Bearings then are realigned, if necessary. Another water test follows, this time testing the additional welds around the bushings.

Both bushings next are diamond-bored in a new machine which handles right and left-hand units at the same time. Next, the top reinforcing ring is reamed and chamfered, and

the exterior thread space is turned.

Four new-type rotary washing machines, utilizing high-pressure jets of hot water impelled by live steam, are used to remove particles loosened by the wire brushes. The cleaning is completed by blowing out the housings with a jet of air under 90 pounds pressure. The housings are dried, then the inside surfaces are sprayed with a lacquer to fix any particles that might become detached in service.

Improved fixtures by which the housings are aligned positively during the broaching of the kingpin holes in the steering knuckles have resulted in much closer finish and consequent improvement in front-wheel alignment. Under the new method the holes can be held to an accuracy of 0.005-inch.

Finally, the top of the housing is threaded to receive the cap. This operation formerly was done early in the manufacturing sequence, requiring the use of a screwed-on protecting ring to safeguard the ⅞-inch threaded band through all subsequent operations. Threading is now the last machining operation and the use of the ring is obviated.

The housing, now complete, undergoes a thorough inspection of every surface, inside and out, being stood up over an aperture in the bench through which is projected a beam of light, which permits the interior to be viewed clearly through the openings for the shock absorbers. After again being washed and blown out with compressed air, the housings undergo a final water test. Those that are O.K., and those that have been corrected by hand-welding, then are hung on the conveyor line to be carried to the assembly section.

On Chevrolet knee-action models the front cross-member of the chassis is a pressed steel piece, oddly shaped, with curves in the vertical and horizontal plane, having a deep channel section and heavy flanges to provide rigidity. Parts of the support are converted into box sections or are reinforced by the addition of other stampings welded in place. The finished support is 44⅝ inches long, without the kingpin yokes, and weighs 27 pounds. The 1935 design is entirely different from last year's, and all dies are new. Manufacturing features credited with having brought about marked improvement in the finished product include planned arrangement of the dies for inspection after each operation, and complete gaging in successive steps.

Five Forming Operations

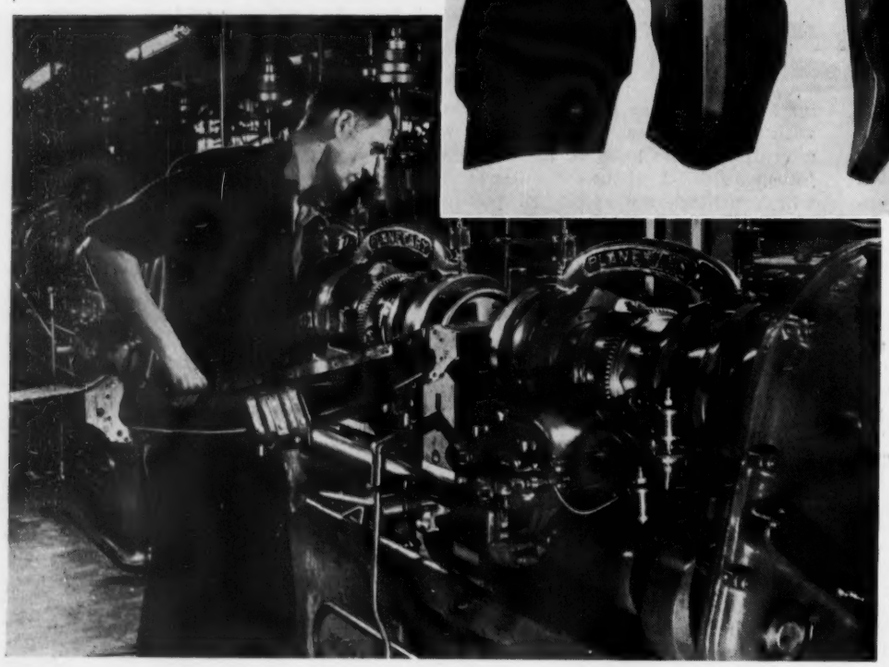
The blank for the main channel section, or lower half, is cut from 5/32-inch steel plate, Fig. 5. Three forming operations follow, then trimming in a press which also punches the pilot hole that serves to locate the work in all subsequent operations.

After the welding of reinforcements and of the upper and lower halves of the support, followed by trimming, both ends are sized in a coining press, to shape the rectangular open ends accurately to fit the extruded flanges on the kingpin yoke forging. The yokes are joined to the supports by flash welding, reinforced by arc welding.

Each support then is checked in an inspection fixture, typical of other new fixtures, in which it is exactly located by air-operated clamps. The chief aim here is to insure that the length is correct and that the attached yokes are aligned in the same plane. The use of newly devised attachments in the welders this year has reduced to 5 per cent the number of supports that require straightening after this test.

The conveyor now carries the supports to the normalizing furnace, which has been increased in heating capacity to take care of the greater mass of material in this year's heavier supports.

In an 800-ton coining press, the largest in the plant, all surfaces of the entire unit are now formed to correct shape. This press, despite its immense weight, is equipped with pneumatic toggle brakes that will stop it instantly although, it is said, so much energy is stored up in the



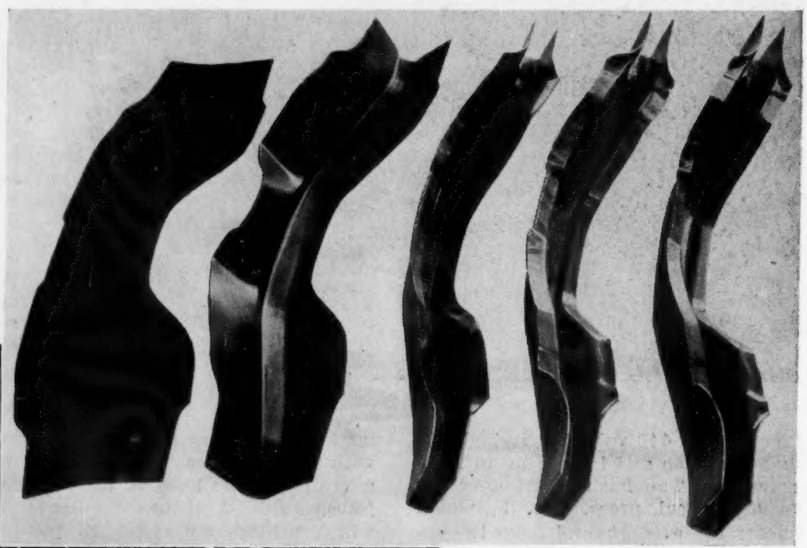


Fig. 4 (left)—Double-end planetary milling machine for cutting slots around the inside circumference of the kingpin hole to receive expanding lock ring retainers for the kingpin bearing plugs. Fig. 5 (above)—Blanking, forming and trimming operations on the lower half of the kingpin support, forming the front cross member of the chassis. Each end of this member carries a forged yoke in which the steering knuckle is mounted

rotating parts that, if the power is cut off, they will continue to run for 2 hours unless the pneumatic brakes are applied.

On another new air clamp fixture, the support is inspected for straightness, alignment, and caster and camber angles. Corrections are made in a hydraulic straightener, Fig. 6, instead of by laborious hand methods formerly used. The piece is fixed in position by hydraulic clamps, controlled by a light lever. Four other levers, two at each end, control the hydraulic pressure that bends or twists the support as required. Each operator, one at either end, has two indicators to guide him, a set of colored electric lights and a pair of wedge-shaped sights. Both indicators, when the piece is clamped down, show if the support is either bent or twisted, and tell the operator in which direction the hydraulic pressure must be applied to correct the error. Quick-acting valves permit the operator to make extremely small corrections, effecting the changes gradually, until the lights or the sights indicate that straightness has been attained.

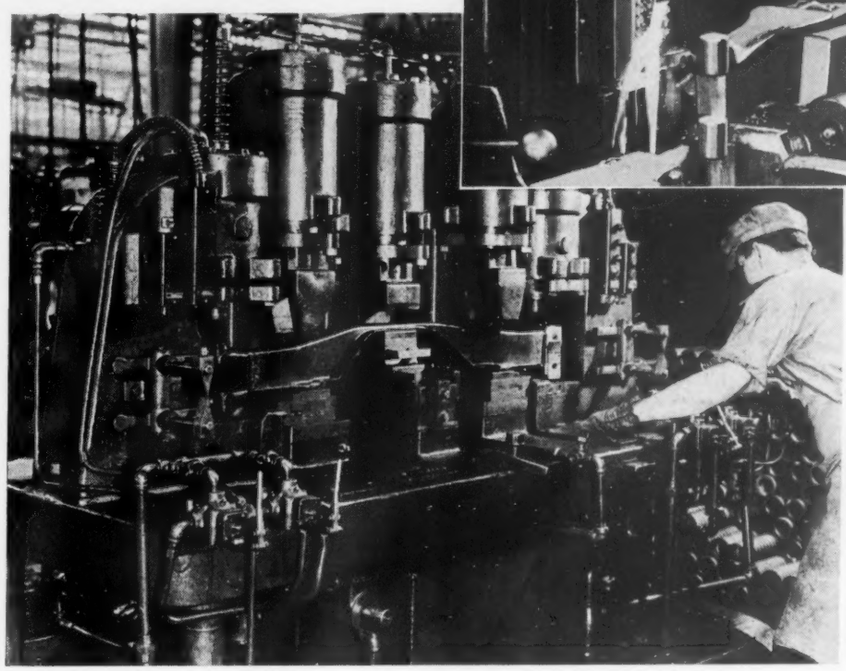


Fig. 6 (left)—Hydraulic power is used to clamp the kingpin support immovably and to bend or twist it if previous gaging has shown it to be out of alignment. Colored electric lights and wedged-shaped sights tell the operator in which direction to apply power for correction. Fig. 7 (above)—Surface broaching the pads near the ends of the kingpin support is done on this machine. Two broaches with diagonal cutting edges are 3½ inches wide and have a 35-inch stroke. Each broach has individual hydraulic drive, each capable of 10-ton pull

Another interesting machine of special design, Fig. 7, is used on the next operation, the surface broaching of the upper bearing surface of the support to effect an accurate seat when the support is assembled to the chassis frame side rails. Both seats are broached at once. The tools operate vertically, each moved independently of the other with a hydraulic drive exerting a 10-ton load. The cutters, having 35 inches stroke, are 3½ inches wide. The diagonal teeth slope in opposite directions, balancing the side thrust on the work.

A basic improvement in finish this year is that the holes for the bolts by which the kingpin support is attached to the chassis, instead of being punched as last year, are drilled in jigs. Three special machines drill 21 holes at once, by means of three groups of drills in separate multiple heads advanced horizontally by hydraulic feed. Another machine drills multiple holes in the angular faces of the support.

Drilling Kingpin Holes

Kingpin holes in the yoke forgings are drilled in a massive four-station machine. Eight horizontal drills operate at once, four on each side of the vertical rotating fixture in which the supports are clamped. The finished support is removed and another clamped in place while work is being done on two other supports in the machine.

A new operation this year is the milling of a slot, Fig. 4, inside the kingpin hole of the yoke, designed to receive a lock spring retainer. A battery of five planetary double-end milling machines is used.

A final inspection precedes the assembly operation in which the kingpin support receives its two knee-action units. The support is located accurately in the inspection fixture by air clamps. Close-fitting gage pins, corresponding to the kingpins, are inserted through the yokes and their inclination (which determines caster and camber in front wheels) is tested in two planes by triangular gages, which slide in slots in the bed-plate. In the fixture are horizontal sliding gage pins which must register with the drilled holes by which the support is bolted to the chassis.

Ship Castings Are Large

The immense size of the QUEEN MARY, new Cunard White Star superliner, may be conveyed by the main hull castings, comprising the four shaft brackets, the stern post, and the rudder stock and frame. The total weight of this group of castings approaches 600 tons.

METHODS AND MATERIALS

Wider Use for New Bearing Material

ALTHOUGH developed primarily for automotive applications, the new cadmium-silver-copper bearing alloys now being produced by the Federal Mogul Corp., Detroit, offer considerable possibility in the industrial field. Steelback bearings lined with this new material now are being supplied to two makers of large production 1935 passenger cars, to one diesel engine builder, one truck manufacturer, and an aircraft engine builder.

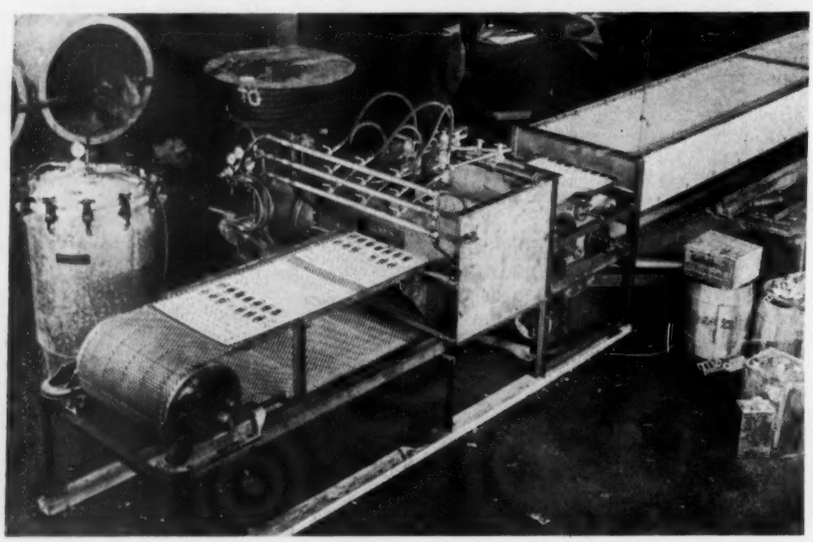
The claimed advantages for consistency and greater ease of manufacturing are in great part due to the fact that the cadmium-silver solution and the cadmium-copper mixture do not differ materially as far as specific gravity is concerned, so that there is little tendency toward segregation, and the resultant metallographic structure is uniform in character.

The alloy has some rather unusual qualities insofar as it is affected by temperature. Tests show that prolonged periods of heating at elevated temperatures have little effect on strength and hardness. Furthermore, the material has a tendency to soften at around 200-250 degrees Fahr., enabling the bearing surface to conform better to the shaft during the break-in period. After prolonged operation at higher temperatures, however, the metal regains its hardness, and retains it subsequently, when cooled. At the elevated temperatures, hardness seems to be about the same for annealed and nonannealed specimens.

Melting point of the CS-50 standard cadmium-silver-copper bearing material runs about 140 degrees Fahr. higher than that of S. A. E. No. 11 babbitt, which is one of the principal reasons the material will stand up under severe operating conditions. Automotive conditions are primarily high speed and fluctuating loads, while in the industrial field loads are more likely to be steady and heavy.

It is possible to deviate slightly from the analysis of the CS-50 alloy to obtain an alloy designated as CS-53. The latter has greater hardness, brinelling over 50 at room temperature; therefore, it would be very much more resistant to deformation under heavy loads, such as might be encountered in the industrial field.

Glossy Coat for Playing Cards



SPRAYING PLAYING CARDS REQUIRES SPECIAL MECHANICAL EQUIPMENT: Automatic spraying machine recently completed by Binks Mfg. Co., Chicago, is shown in this illustration. Cards are fed to the machine on an endless mesh conveyor belt and receive an even gloss coat as they travel past the three automatic spray guns. Not shown in the illustration is a special exhaust spray booth set over the gun chamber to collect the spray mist. The mesh conveyor has an adjustable speed control of 16 to 48 feet per minute and is belt driven by a ½-horsepower, 220-volt, 3-phase, 60-cycle electric motor. Sprayed cards are ejected on an endless canvas drying chamber belt more than 50 feet long. The insulated drying chamber is filled with hot air from a gas heater located at the unloading end. The heater is equipped with a ¼-horsepower electric motor blower. On reaching the unloading end the cards are dry and ready for cutting

\$ \$ \$

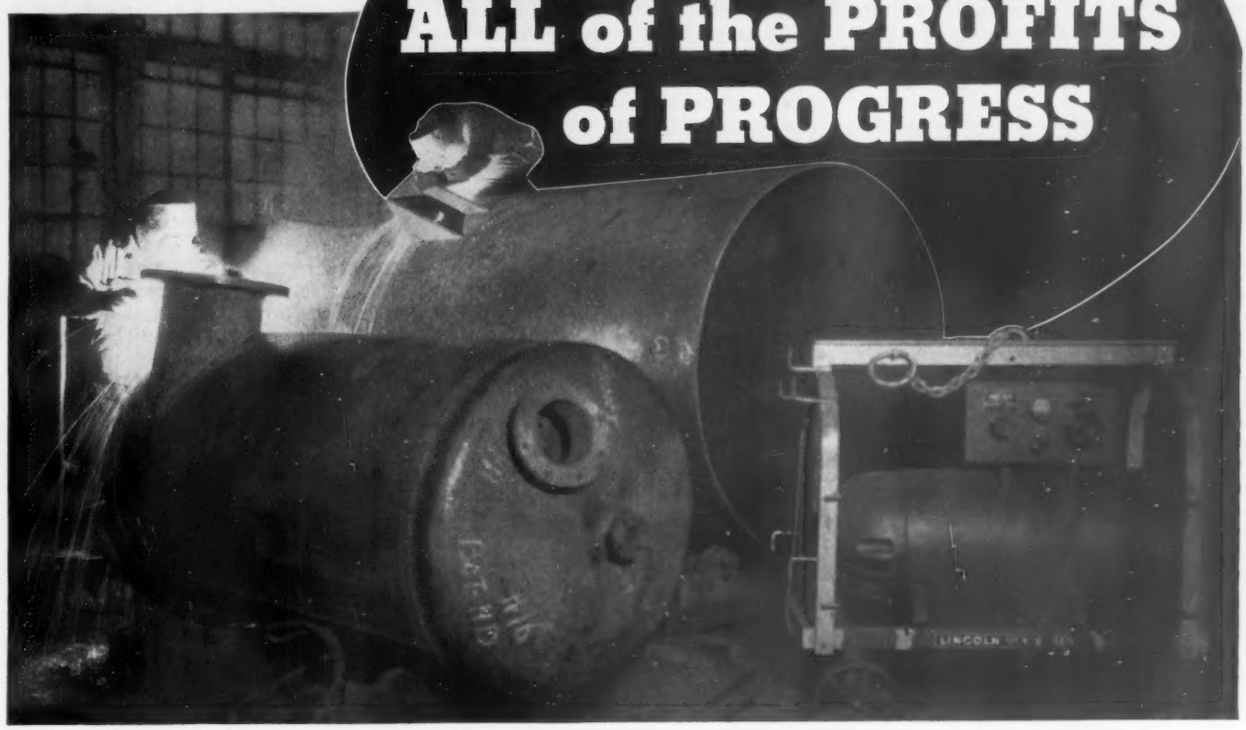
Theoretical Heat Is Not Approached in Gas Cutting

The theoretical combustion temperature of iron and oxygen is over 10,000 degrees Fahr. and this heat could conceivably be generated by the union of extremely finely divided iron particles intimately mixed with the corresponding amount of oxygen, according to G. V. Slottman, Air Reduction Sales Co., New York. For practical purposes, this temperature is never even approached.

The cooling effect of adjacent

Gives you ALL of the PROFITS of PROGRESS

• *Pressure vessels being fabricated by Lasker Boiler and Engineering Corporation, Chicago, Ill. with* "Shield-Arc" *welders and* "Fleetweld" *electrodes.*



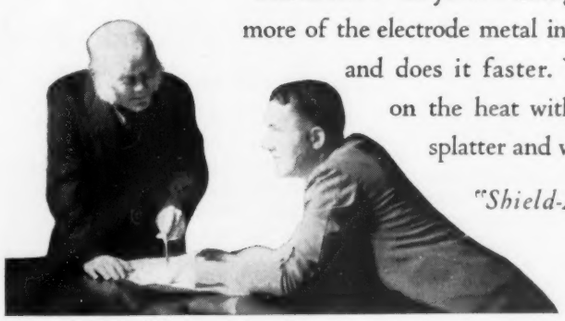
FASTER welding. Better welds. Lower costs. These are the profits of progress. You get them *all* when you weld with a *"Shield-Arc"*. Because it is the only welder having all the time-saving, labor-saving, power-saving and material-saving features which allow you to get the most out of welding.

"Shield-Arc's" uniform welding current puts more of the electrode metal into the weld—and does it faster. You can turn on the heat without excessive splatter and waste of metal.

"Shield-Arc's" higher capacity lets you use larger electrodes. Jumping one size often cuts welding costs 10% to 25%.

"Shield-Arc's" greater efficiency reduces power costs. Gives you more welding per kilowatt-hour.

Eight other features, all contained in no other welder, contribute their savings to your profits. *"Shield-Arc"* welders are guaranteed three ways to give you *all* the profits of progress in arc welding. Find out now how big these profits are. Ask The Lincoln Electric Co., Cleveland, Ohio. Largest Manufacturers of Arc Welding Equipment in the World.



POP "I've always believed in the 'cut and try' method. But with 'Fleetweld' electrodes, it's a case of try first and the cutting will take care of itself—in our case, the cutting was 20% of former welding costs."

LAD "Righto—and Lincoln showed me how to cut the cost of cutting tools by facing them with 'Toolweld'—a new electrode which produces a more durable cutting edge than high speed steel. Ask Lincoln about it."

W-120

LINCOLN

"SHIELD-ARC" WELDERS

metal in steel cutting, the tendency of the molten metal ahead of the cut to run away from the seat of the reaction before combining with oxygen, and the slowness of the oxidation reaction due to the small surface of metal exposed to the oxygen stream, among other factors hold the reaction temperature down to little more than the melting temperature of the metal cut. In steel cutting, the temperature of the molten metal, or molten oxide slag is about 2800 degrees Fahr.

It will be noted, that at least 30 per cent of the heat of the iron-oxygen reaction is absorbed in melting, since only about 70 per cent of the metal removed from the kerf in moderately heavy cutting is oxidized. It is further possible to continue cutting after turning off the preheating flames, under favorable conditions, which shows that heat is being conducted rapidly from the seat of oxidation reaction, preheating the plate ahead of the cut to kindling temperature. This rapid removal of heat from the source of the reaction, explains why the very high theoretical combustion temperature of the iron-oxygen reaction cannot be approached in practice.

$ $ $

Cast Iron Enamel Blisters From Too Much Moisture

Practice in one manufacturing plant was to spray cast iron parts with enamel and to hang them while wet on to the conveyor chain of the continuous furnace. The entrance end of this furnace served as the dryer. At various times this company had serious difficulties with the enamel blistering, until finally a porcelain enamel service engineer was called in.

From a study of the situation, the engineer learned that the trouble usually was much worse on damp, rainy days than on fair and dry days. This suggested that moisture in the atmosphere might be causing the trouble, so trials were made by predrying sprayed castings and allowing only perfectly dry ware to enter the furnace. An immediate improvement in results was noted. Later the laboratories with which the service engineer was affiliated demonstrated conclusively that a too high concentration of water vapor in the burning chamber produces harmful results when either cast iron or sheet iron enamel is being fired.

$ $ $

High Chromium Iron Pours Well Despite Appearance

The surface film which appears on high chromium iron in the ladle is very deceptive, for it gives the iron the appearance of being too cold and sluggish to pour well. Actually this is not the case and iron containing 15 per cent or more chromium is very fluid and can be handled in the same way as ordinary iron. It retains its fluidity, and no special methods of molding are necessary. High chromium cast irons are finding an increasing number of applications in high temperature work as adjuncts to the heat-resisting steels.

$ $ $

Alloy Steels Possess Air Hardening Properties

The term "balanced alloy" is gaining recognition as a name applicable to certain alloy steels. These are steels which have been so designed that the air hardening characteristics are sufficient to strengthen the alloy markedly without impairing its ductility and at the same time to permit the steel to be fabricated without difficulty by the usual processes. Examples of balanced alloys are cromansil steel and the 3 per cent chromium steel with low manganese and silicon and carbon under 0.30 per cent.

$ $ $

Zinc Chromate Primer Offers Protection to Metals

A corrosion inhibiting primer for all varieties of metal surfaces, including dural, aluminum, alclad, steel and cadmium plated parts, has been placed on the market by Berry Brothers, 211 Leib street, Detroit. Known as Berryloid zinc chromate primer P-27, this material was developed several years ago and during the intervening time has been used extensively in connection with naval contract work and particularly the manufacture of naval aircraft.

A complex substance of variable composition, it is formed as a yellow precipitate by the action of potassium dichromate on pure zinc oxide neutralized by acid. It is furnished in a heavy, viscous state and must be reduced 200 to 300 per cent with toluol for spray application. Because of the rapidity with which it dries it is best applied by the spray gun method. When properly applied it leaves a smooth film greenish in color and requiring no sanding. Its hiding qualities are poor. Baking at any temperature up to 350 degrees Fahr. improves its ultimate durability.

This product, it is stated, offers unusual resistance to the formation, development and progression of corrosion or rust when used as a protective coating between similar or unlike metals when they are in contact with each other, as in a seam or riveted lap joint. The primer, it is stated, now is being used by at least 11 aircraft manufacturers. It is claimed to have possibilities in solving corrosion problems in connection with bridges, on railroads, in steamships, oil refineries, etc.

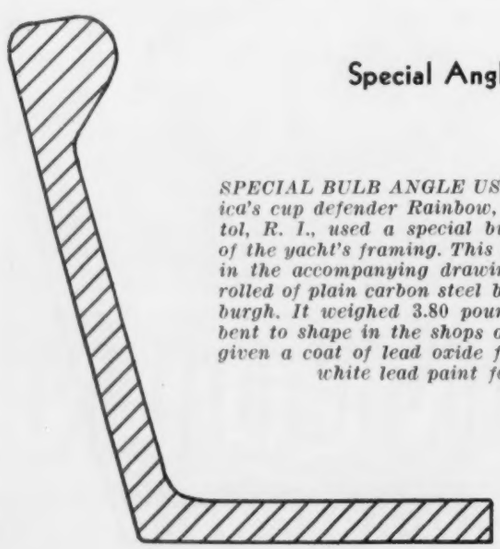
$ $ $

New Standard Foundry Sand Specifications Adopted

Standard specifications for foundry sands, adopted as the result of a cooperative investigation by the naval gun factory and the national bureau of standards, have made possible a standardization of molding practice which should lead, the government believes, to a general improvement in castings.

To date, it is pointed out, the physical properties of fourteen types of foundry sands have been studied and the limits for variation in grain fineness number, grain content class, grain distribution, grain shape, permeability, compressive and tensile strengths, surface hardness, and sin-

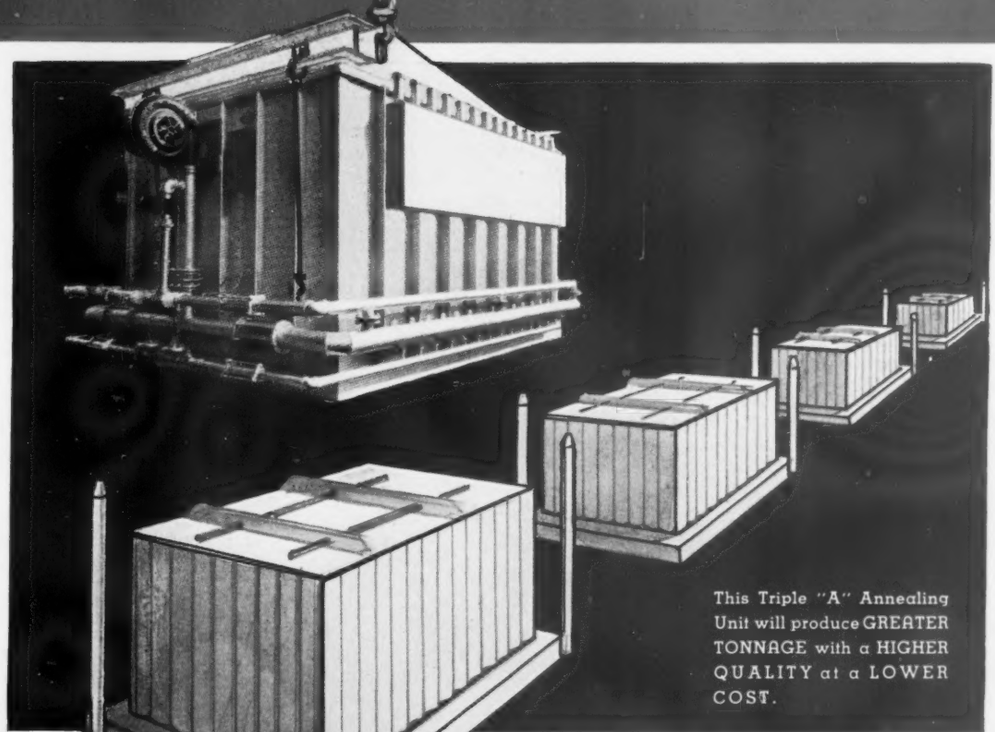
Special Angle for Rainbow



SPECIAL BULB ANGLE USED: In constructing the America's cup defender Rainbow, the Herreshoff Mfg. Co., Bristol, R. I., used a special bulb angle as the integral part of the yacht's framing. This angle, reproduced to exact size in the accompanying drawing, was 2 x 3 inches and was rolled of plain carbon steel by the Carnegie Steel Co., Pittsburgh. It weighed 3.80 pounds per foot. The angles were bent to shape in the shops of the Herreshoff Mfg. Co. and given a coat of lead oxide followed by a coat of ordinary white lead paint for finishing purposes

Lee Wilson invented, developed, perfected and patented the Tube Type Annealing Furnace.

They are sold exclusively by the Lee Wilson Engineering Co. and The Wean Engineering Co., Inc. No other company has been given the right to manufacture or sell them in the United States or Canada.



This Triple "A" Annealing Unit will produce GREATER TONNAGE with a HIGHER QUALITY at a LOWER COST.

An Exclusive Development of

LEE WILSON ENGINEERING CO

1370 Blount Street • Cleveland, Ohio

SOLD BY THE WEAN ENGINEERING CO., INC., WARREN, OHIO

tering point have been established. On the basis of these data, purchase specifications have been formulated.

Each type of foundry sand requested by bid is required to be equivalent to a reference sample maintained at the national bureau of standards upon which physical properties have been determined. Each specification indicates methods for sampling sands and describes suitable methods of testing, the result being greater uniformity in the supplies of sands obtained, it was stated.

Builds Steel-and-Wood Drafting Tables Embodying Several Innovations

SAID to be the first major improvement in design and construction of four-post drawing tables in many years, Hamilton Mfg. Co., Two Rivers, Wis., has introduced a new line of "Steelwood" drafting tables. As the name suggests, the tables offer a combination of both steel and wood.

Cost of the steel-framed tables is no higher than four-post tables of all wood construction. Framework is of welded steel construction, insuring rigidity and freedom from repairs. Drawer units are of wood construction, while the drawers themselves have steel fronts finished in olive-green to harmonize with the all-steel body.

The tables are being offered in three sizes, with a variety of drawer combinations to meet various drafting room requirements. They are finished in olive-green baked enamel to match other steel equipment in drafting rooms.

A height of 37 inches has been incorporated in the construction, instead of the former standard 30-inch height. In establishing this height as a standard, the use of raising blocks is eliminated.

Other developements in this line of tables include the introduction of a coaster drafting chair and a battery of coaster lights for illuminating the drawing boards.

Adjustable for Comfort

The coaster chair, in addition to providing an effortless lateral movement in front of a drafting table, permits a forward and backward movement through a pivot in the lower part of the frame. The seat, as shown in the illustration, may be adjusted for height and proper distance from the table.

Front legs of the steel chair are supported on a lateral track attached to the drafting table, with ball-bearing fiber wheels running in a channel guide. The outside legs have ball-bearing casters which roll on the floor.

The chair seat and back rail are padded and covered with a durable brown simulated leather. The chair is finished in olive green enamel.

The new coaster drafting lights comprise three adjustable lights, attached to a ball-bearing, rolling unit which runs in a channel at the rear edge of a drawing board. This battery of lights may be moved along the back of the drawing board, wherever needed. In addition to the sidewise movement each individual lamp may be swung in a circle, thus giving the desired illumination needed in any particular area. All parts are of steel, with the exception of light arms of ½-inch brass tubing.

Combination steel and wood drafting table with attached "free-wheeling" chair, of adjustable steel construction

Refractories Information Published in Pamphlet

A.S.T.M. Standards on Refractory Materials; paper, 143 pages, 6 x 9 inches; published by American Society for Testing Materials, Philadelphia; supplied by STEEL, Cleveland for $1 postpaid; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London. Special prices on ten or more copies.

In addition to all of the 21 specifications, test methods and definitions standardized by the American Society for Testing Materials through the work of its committee C-8 on refractories, this publication includes the manual on interpretation of refractory test data, detailed information on the standard samples of type refractory materials and reports of extensive industrial surveys showing the service conditions of refractories in outstanding consuming industries.

The specifications cover clay fire brick for various uses, refractories for the construction of incinerators, ground fire clay, and quicklime and hydrated lime for the manufacture of silica brick.

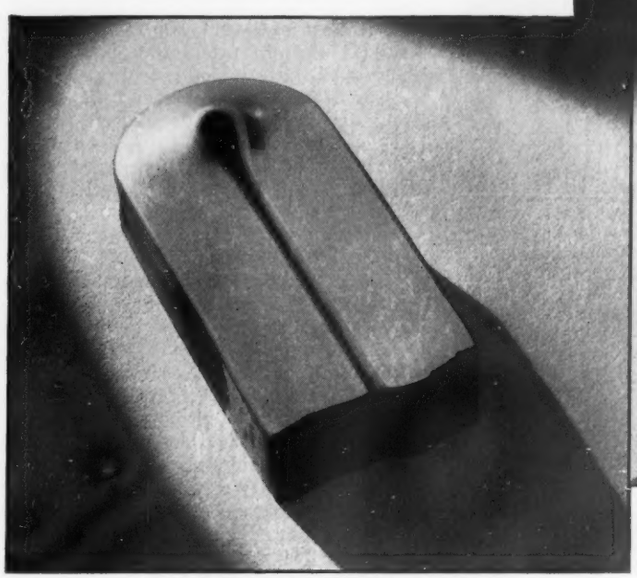
Included in the standard methods of testing are the following: Porosity and volume changes; particle size of ground materials; panel test for resistance to thermal and structural spalling; permanent linear change; test under load at high temperature; softening point; high-temperature heat insulation; and chemical analysis of refractory materials.

Accurate investigation of refractory materials is difficult unless competent methods are used to analyze and report the groups of data developed. The manual on refractory test data evaluates the methods of interpretation. First issued in 1932, the current manual is extensively revised and simplified.

To help maintain accuracy in the chemical methods of analysis, a series of standard samples of type refractory materials has been developed in co-operation with the national bureau of standards and a large number of laboratories. The

NOW AVAILABLE !

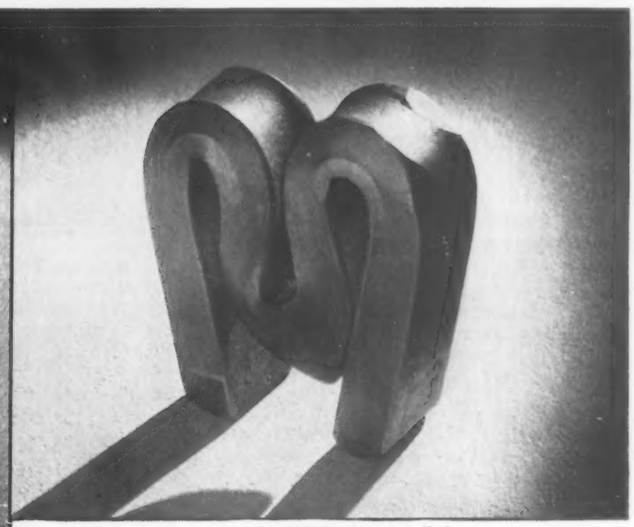
A Tough High-Strength Steel with Exceptional Welding Qualities



1½" Thick Plate; as rolled

Physical Characteristics

Test	*Yield Point*	*Tensile Strength*	*Elongation in 8"*	*Reduction of Area*
Longitudinal	61,650	82,700	32.5%	73.0%
Transverse	61,000	81,700	31.0%	63.5%



6" x 6" x $\frac{9}{16}$" Angle; as rolled

Physical Characteristics

Test	*Yield Point*	*Tensile Strength*	*Elongation in 8"*	*Reduction of Area*
Edge	67,300	85,250	21.9%	68.2%
Corner	67,050	89,700	19.4%	61.9%

Like all Vanadium Steels, the recently developed Manganese-Vanadium type of low vanadium and carbon content combines high strength with great toughness. Note the cold bend tests illustrated above. A 6" x 6" x $\frac{9}{16}$" angle with two 180° bends . . . a 1½" plate bent flat . . . neither specimen showing any sign of fracture. Manganese-Vanadium is a tough, high strength steel, developed particularly for structural applications. It permits material weight-savings.

Another desirable feature of Manganese-Vanadium Steel is its fine welding qualities. Unlike most high strength steels, its qualities are practically unaffected by welding heat.

If you are seeking high strength and toughness with good welding qualities, it will pay you to investigate the advantages of Manganese-Vanadium Steel. Our Metallurgical Engineers have interesting data.

VANCORAM BRAND

FERRO-ALLOYS

of vanadium, silicon, chromium, titanium, and silico-manganese, produced by the Vanadium Corporation of America, are used by steel makers in the production of high-quality steels.

VANADIUM CORPORATION OF AMERICA

120 BROADWAY, NEW YORK, N. Y.

CHICAGO — PITTSBURGH *Bridgeville, Pa.* — DETROIT

Plants at Bridgeville, Pa., and Niagara Falls, N. Y.
Research and Development Laboratories, Bridgeville, Pa.

VANADIUM STEELS

for strength, toughness and durability

composition of these samples is given in tabular form.

It has been essential to have adequate information on the conditions under which refractories are used in manufacturing processes. Comprehensive surveys have been made of such conditions in outstanding consuming industries, including the following: Open-hearth practice; malleable iron industry; copper industry; lead industry; and by-product coke ovens. These reports should be of much interest to those concerned with refractory materials.

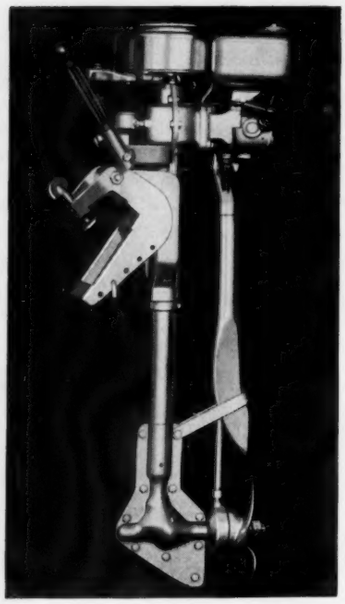
Dispatch Boats of Arc Welded Steel

CONTRACT for 18 arc welded steel service launches to be operated in Venezuela was recently awarded to Jakobsen & Petersen Co. Inc., Brooklyn, N. Y., by the Lago Petroleum Corp., subsidiary of the Standard Oil Co. of New Jersey. Of the dispatch boat type, these vessels were designed by the owners as small passenger and cargo vessels for transporting mail and light supplies.

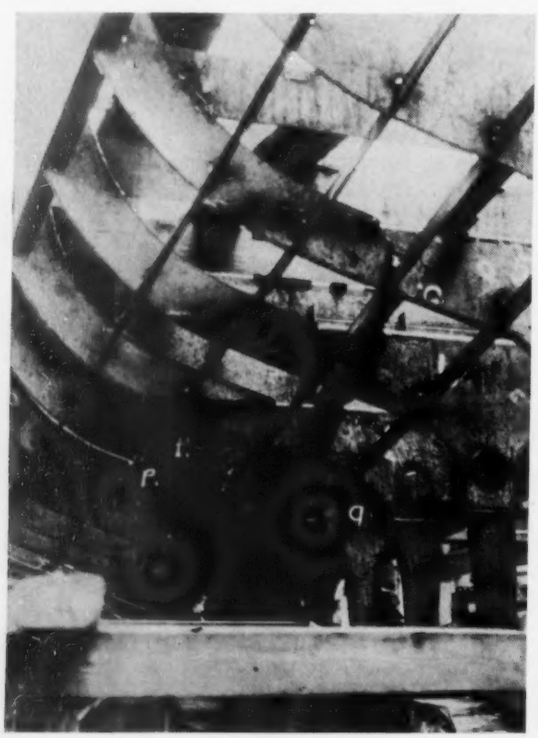
These vessels are 44 feet in length, 10 feet beam, 4 feet 3 inches draft. Each boat is designed for one-man operation and will be powered with a 100-horsepower diesel engine.

Construction consists of a bar keel ⅞-inch thick by 3½ inches wide and an interesting system of hull framing. The latter is made up of transverse frames ¼-inch thick by 6 inches wide and spaced 18 inches apart. These transverse frames are notched on the outboard face to receive longitudinal stringers which are welded to each frame from stem to stern. Construction of these stringers is shown in the accompanying illustration.

Except under seams, these stringers are ¼-inch thick by 3 inches wide. Where the stringers are in the way of seams, they are ⅜-inch thick and 3 inches wide. These latter stringers serve as seam battens and when longitudinal seams are welded, the hull plating, in addition to being welded together, becomes integral with the framing. The hull plating thickness is ¼-inch on deck and 3/16-inch in sides and bottom. All welding on these vessels was done with equipment manufactured by the Lincoln Electric Co., Cleveland.



New outboard motor represents radical departure from usual construction methods; it is built almost entirely of steel stampings



STEEL dispatch boats for Venezuela, showing notched transverse frames and longitudinal stringers ready for welding

New Outboard Motor Built Of Steel Stampings

A new outboard motor developed and placed in production by Cedarburg Mfg. Co., Cedarburg, Wis., represents a departure from customary design and construction in this field in that it is made almost entirely of steel stampings. As a result, the company claims, it is so rugged as to be almost indestructible. It can be dropped on a cement floor, it is claimed, without harm.

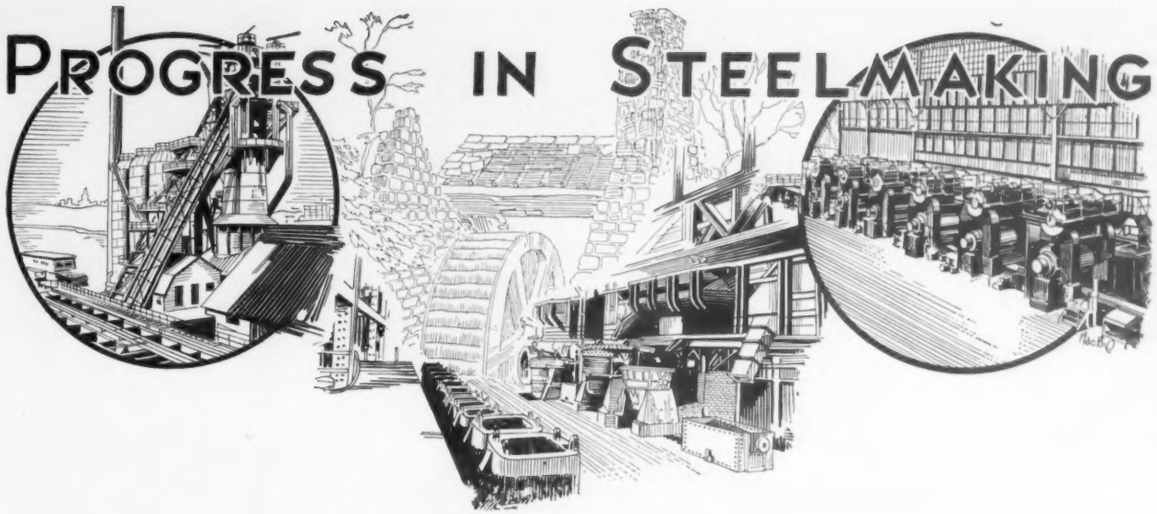
Sold under the tradename Thor, after Thor Hansen, president of the company, the new motor weighs 35 pounds and sells for $39.75 at the factory. It has cast iron cylinder, aluminum piston, phosphor bronze connecting rod, alloy steel crankshaft, self-lubricating bronze bearings, alloy steel drive shaft, chromium-nickel iron gears, aluminum propeller. Other parts include a flywheel magneto, centrifugal cooling pump, gasoline tank, specially designed carburetor and under-water exhaust. It develops an average speed of 6 miles per hour.

Prepares Film Portraying Development of Lathe

A new industrial film entitled "The Development of the Lathe," has just been produced by the Monarch Machine Tool Co., Sidney, O. In quick, dramatic fashion, this film pictures the original tree or pole lathe of 500 A. D. through its successive stages of development. Then in sequence it shows the first wood screw cutting lathe of the fifteenth century, the first iron lathe of 1800 A. D., the first quick-change gear lathe of 1890 and the first geared-head lathe of 1900. The film finally pictures a number of the Monarch company's machines in operation.

A limited number of these films is available, in two sizes—about 1000 feet of 16-millimeter safety-type film and about 2000 feet of 35-millimeter film. These are available for loan and circulation to industrial organizations, technical societies, educational institutions and others, and may be obtained for showing by addressing W. E. Whipp, Monarch Machine Tool Co., Sidney, O.

PROGRESS IN STEELMAKING



Grinding Time Is Reduced

Vibration is eliminated in a new roll grinder by a multiple V-belt drive for rotating the rolls. At one plant rolls that formerly required five to six hours now are being ground in two hours with a perfect surface free from marks of any kind. A flexible faceplate with balanced self-equalizing bar equipped with adjustable rubber-bushed driving dogs compensates for inequalities in roll wabblers and automatically minimizes inaccuracies due to minor errors in setting the roll. By increasing the grinding wheel from 30 to 36 inches diameter and using the same wheel surface speed, the speed of the spindle is reduced, thus permitting a closer fit of the bearings, and at the same time resulting in cooler running bearings.

♦ ♦ ♦

New Type Brick Available

New chrome refractory has been introduced in order to meet the demand for super-refractory which could be substituted more widely for silica-brick above the slag line in open-hearth furnaces. The refractory is made by a process which utilizes accurate grain sizing, hydraulic pressing and an all-temperature bond which eliminates the necessity for firing the brick. The unburned brick has approximately 30 per cent lower thermal conductivity than similar burned refractories, it is stated. Furthermore, better resistance to slag and metal attack is obtained on account of the high pressures used and the dense body developed by the pressing operation.

♦ ♦ ♦

Output Increased Ten Fold

Hard facing the gripes of a spike machine operated by a Pennsylvania company afforded the production of 800 kegs of railroad spikes whereas untreated gripes produced only 80 kegs. One half pound of hard facing materials is used to face the wearing end. Three regrindings per application of the hard facing are possible.

♦ ♦ ♦

Lime Consumption Varies

Based on a monthly average the lime consumption at most wire mills ranges from 3 to 5 pounds per ton of rods coated, irrespective of the size or gage of the bundle or thickness of coating, according to an engineer. This compares with a requirement of 30 pounds of silicate of soda to coat 35 tons of ½-inch rods.

♦ ♦ ♦

New Test Method Is Simple

The thickness of a tin coating on steel now can be determined rapidly by a new simple method. Tin from a known area is dissolved by a cold solution composed of antimony chloride and hydrochloric acid, and

Five Money-Saving Ideas

Application of a protective coating to the surface of blueprints, charts, plans, weight sheets and papers which undergo considerable handling in various departments of steel plants protects their legibility. A suitable varnish for this purpose is made by dissolving celluloid in acetone.

♦ ♦ ♦

Worn shop floors can be resurfaced easily by applying a mixture of emulsified asphalt and cement, thus extending their life. Two parts of asphalt are used to four parts of sand and one part of cement. After the sand and cement are mixed thoroughly, the asphalt is added followed by sufficient water to make the mixture suitable for troweling.

♦ ♦ ♦

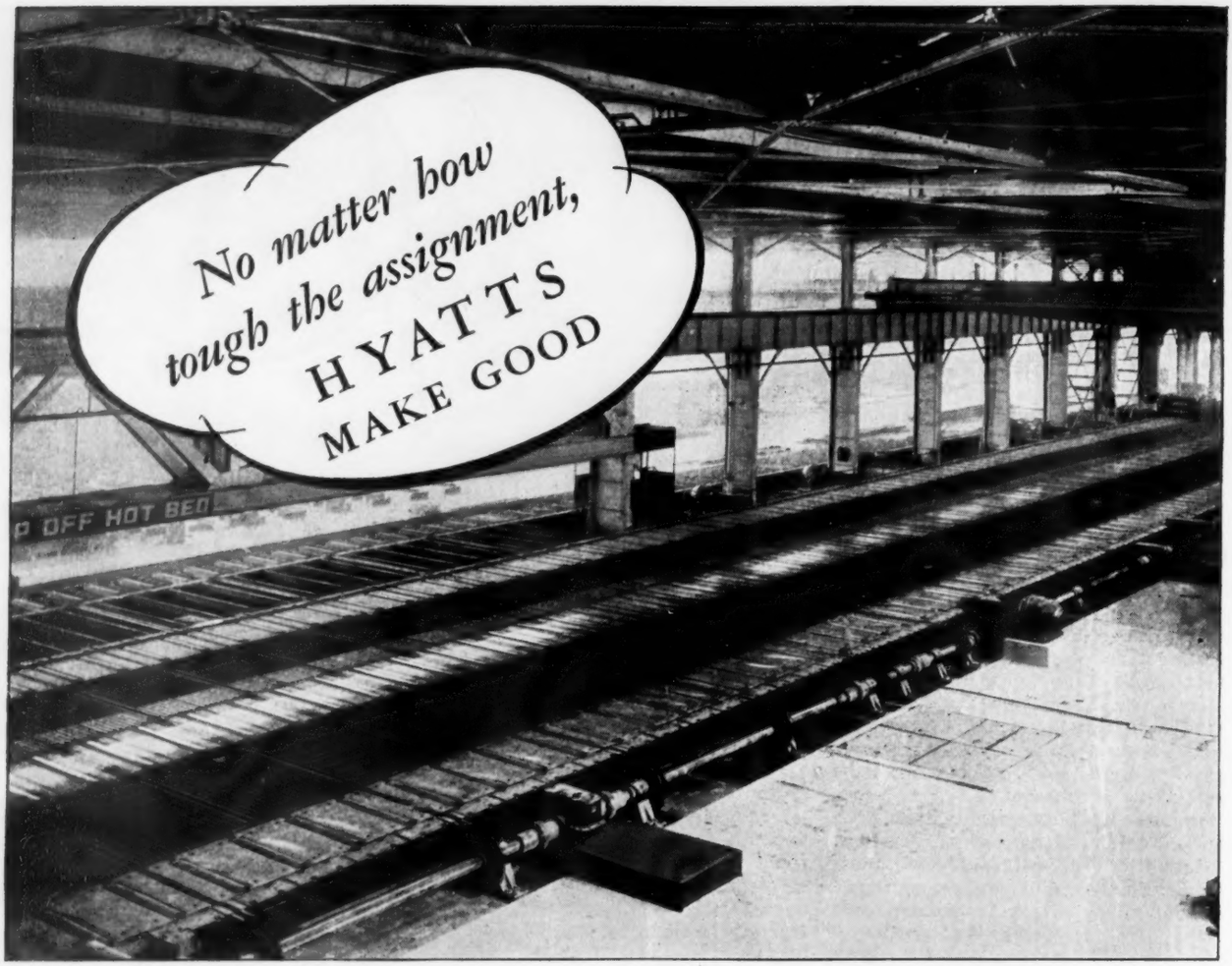
Illegible black figures and graduating marks on the dials of pressure gages used at blast furnaces and steelworks can be restored easily. The dial is cleaned with gasoline and then given a coat of white varnish. When dry a coat of a mixture of shellac and lampblack is applied. When this is dry the excess lampblack is removed from the face of the dial by polishing with fine emery cloth, care being taken not to disturb the deposit in the graduated depressions.

♦ ♦ ♦

An electric magnet will handle cold rolled strip and cold drawn shafting crated for shipment as easily as uncrated steel.

♦ ♦ ♦

Sewers, which conduct the discharge water from blast furnace gas washers to sumps, can be kept open by the exhaust air from a hot blast stove. A pipe from the blowoff valve of the stove is made to terminate near the dead end of the sewer and when the stove is blown off, the air increases the rate of flow of the discharge water. This removes the sediment and thus prevents clogging.



On this Mesta Machine Company standard hot bed for continuous sheet mill all rollers are Hyatt equipped.

Heavy going of day in and out operation demonstrates the necessity of bearings that are correctly built and soundly engineered for the application.

Hyatt Roller Bearings measure up to this assignment and ask no special favors of time or attention. They have in their make-up the stuff it takes to withstand the rigors of shocks and strains — endurance to shoulder heavy loads under extreme conditions—inbuilt stamina for hard service over long stretches.

Thus, thousands of machine and equipment builders have learned to rely upon the experience and facilities of the Hyatt factory and field forces as their source of supply for bearings of unfailing dependability. Hyatt Roller Bearing Company, Newark, Detroit, Chicago, Pittsburgh, Oakland.

HYATT
ROLLER BEARINGS
PRODUCT OF GENERAL MOTORS

its amount is determined by the loss of weight of the specimen. Although the base metal is unattacked, a slight correction is applied to compensate for the tin-iron alloy layer. In addition to speed, the method has the advantage that the thickness of tin on a given portion of the surface can be determined by protecting the remainder with a coating of cellulose varnish.

• • •

How Guides Are Reclaimed

Bronze side guides on cold sheet mills which rapidly are cut away by the edges of the sheets, are reclaimed successfully by an Ohio sheetmaker using tobin bronze filler rod and an oxyacetylene flame.

• • •

Wear of Rolls Is Checked

Treating conveyor rolls and shaft bearings used in heating furnaces with hard facing alloy has been found to be advantageous by an Alabama steel company. These rolls operate at 750 degrees Fahr. and it is impossible to lubricate the bearings. After a run of one month, the first bearings hard faced showed no signs of wear.

Iron Oxide Control in Slag Affords Uniform Product

IT SEEMS particularly fitting that the work of the Metallurgical Advisory Board should be climaxed by a contribution of Dr. Herty and his associates, dealing with a problem of immediate and practical importance to all steelmakers. Iron oxide control is the logical sequence to the comprehensive investigations of the past decade dealing with basic open-hearth metallurgical and physico-chemical problems.

The open-hearth operator is not primarily interested in the production of steels with "magic" properties but rather in constantly reproducing given steels with specific properties which, on uniform treatment, will result in desired qualities in the consumer's hands. A control which offers some assurance of increasing uniformity of results is highly desirable. Present and past steelmaking practices are founded on identical fundamental principles, but modern open-hearth practice is distinguished by definite advances in the application of these common principles and iron oxide control promises to be by no means the least important.

System Is Flexible

Dr. Herty's valuable contribution indicates that the open-hearth operator, within limits can change his slag composition at will and thereby exercise definite control over the state of oxidation of the bath. That iron oxide control can be applied under certain conditions with satisfactory results has been clearly demonstrated by him and substantiated by the experience of those plants which have undertaken this type of slag regulation. The more complete application of iron oxide control of slag may be said to be due to the development of rapid methods of determining iron oxide in slag and other quick indices as opposed to the historical type of slag analysis typical of past practices.

The goal sought is a low iron oxide content in the slag at melt or in the early stages of the refining period, this being later raised if desired by the judicious use of limestone, lime, roll scale, fine ore, etc., consistent with the type of steel produced, and if too high in iron oxide, sulphur and other conditions permitting, may be reduced by the proper use of sand, etc. In order to obtain this condition, various types of control are involved, one of them being the adjustment of pig iron and scrap to result in a relatively constant amount of oxidized silicon and manganese into the slag, yielding a slag of constant composition to correspond with the grade of steel desired. This is the ideal control method, but it cannot be attained in present-day open-hearth practice since it is impractical to adjust pig iron and scrap to yield identical chemical and physical composition of the charge, not to mention the fact that it requires constant and identical furnace conditions.

Therefore, a compromise from the laboratory ideal is required and the customary type of control is that by which a relatively weak basic slag is obtained at melt by charging a deficit of limestone, silicon and manganese content of the charge being considered, resulting in a minimum iron oxide content of the slag in the early stages of the refining period, consistent with the type of steel desired. This iron oxide content can be raised as described by Dr. Herty. This method, typical of cold iron plants, is of particular value where the analysis of the pig iron is known in advance and required adjustment of charged fluxes may be made to obtain desired lime-silica ratio. Further compromises are required in hot metal operations because of unforeseen variations in the analysis of pig iron, and plants operating with run-off slags using large amounts of pig iron, represent the least ideal basis for the complete development of iron oxide control of the character outlined.

Character of Slag Varies

Dr. Herty's contribution is based on practices of plants employing no run-off slags and in a sense may be said to represent a more nearly ideal condition for full attainment of the benefit of this control method than the majority of steel producing units. Run-off slags vary considerably in character and amount, particularly the latter, which in turn depend upon many factors. As a result, in such operations there is far less uniformity of remaining metalloids and available limestone in the furnace than is true of plants operating without such slags and under these conditions the full application of iron oxide control is far more difficult. By this token, it would appear that these plants have greater need of iron oxide control than where the more nearly ideal conditions exist. Even under most ideal conditions of selected scrap and reasonably constant composition and percentage of pig iron at such plants, the resultant slags at melt may vary over rather wide ranges.

That the problem of plants operating with run-off slags is far greater can be appreciated from the fact that these slags may constitute up to as much as 60 per cent or more of the total furnace slag weight and if the pig iron proportions are being changed constantly for economic or other reasons, this control method becomes even more complicated. It

ONE of the papers presented at the afternoon session of the eighth open meeting of the Metallurgical Advisory Board held at the Carnegie Institute of Technology, Pittsburgh, Feb. 8, was "The Control of Iron Oxide in the Basic Open-Hearth Process." In discussing this paper, C. D. King, chairman open-hearth committee, United States Steel Corp., New York presented data of importance to plants operating with run-off slags. Mr. King's remarks are presented herewith.

is necessary in this connection to consider the silica content of charge ore on high pig iron charges, which may be as much as 30 per cent or more, of the total silica contributed by all materials in the charge, including the furnace structure. Therefore, plants operating with run-off slags can only approximate the character of the melting slag desired and must necessarily depend upon adjustment of this slag during the refining stages of the heat. Since iron oxide adjustments of slag can be made only within reasonable limits, the success of this practice at such plants will depend almost entirely on the regularity in composition of the pig iron, all other conditions being equal.

Compromises Are Necessary

High-phosphorus and high-sulphur pig iron frequently necessitate compromises between basicity of slag and iron oxide content, particularly in the production of high-carbon or killed steels requiring extreme cleanliness. It, therefore, may be concluded that the blast furnace operator has no small part in the full attainment of iron oxide control in basic open-hearth practice. The most convenient and exact type of slag control is that which results from definite uniform charges requiring minimum manipulation and departure from this ideal condition results in all manner and degrees of iron oxide control and compromises of the ideal with the practical.

Dr. Herty clearly has indicated several features in connection with iron oxide control in slag which appear to require emphasis. One is the tendency for some operators to assume that simple relationships between iron oxide and lime or other straight-line comparisons, under all conditions will result in complete correlation or, in other words, that only one variable exists at a time. While such a treatment is highly desirable, there are many phases of the subject which require further investigation before these can be used under all circumstances.

Another important factor is that while chemical analysis of slag will show total percentages of all elements, it does not necessarily follow that all of these are available in the process at any given time, since some are present as solid particles in the liquid slag and do not participate in the effect of the slag on the steel.

Yield Is Less

Dr. Herty also has emphasized that a high iron oxide and a high basicity in slag often will yield less metal oxidation than a lower iron oxide with a less basic slag. In other words, the effect of "excess lime" must be considered and operators who have correlated the physical character of slags with iron oxide fully appreciate the necessity of recognizing this important factor.

Another feature worthy of consideration is that a low iron oxide in steel having once been attained prior to deoxidation, does not necessarily assure that the final steel will contain a proportionately small amount of inclusions. While this should follow, it results only if the proper type of deoxidation is employed, all other conditions being equal.

The economies indicated by Dr. Herty and others who have contributed information on the subject in the past are cost savings and metallurgical advantages. The magnitude of these benefits will depend largely upon the excellence of plant practices prior to the use of iron oxide control. If this type of control, accompanied by a reduction in the amount of limestone implies both a lower iron oxide content in slag and smaller slag volume, it obviously results in an increased ingot yield. It is my opinion, however, that any exaggerated increase in ingot yield should not be expected, since this increase can come about only by a slightly greater residual manganese and lower iron losses and the latter cannot be enormously different from those of previous practice unless such practices were seriously at fault. This may be qualified only to the extent that there may be a reduction in the scrap produced, in the form of condemned ingots, due to more perfect control of phosphorus reversion and fewer off-heats. Further savings may be expected in view of the less oxidized condition of the bath and a greater efficiency of deoxidizers resulting.

Advantages Are Cited

From a metallurgical standpoint, if the number of inclusions is a criterion of the quality of steel, it follows that those steels requiring a smaller amount of deoxidizers than formerly, also will contain a proportionately lower amount of deoxidation products, proper deoxidation methods being employed. While these collateral advantages are highly desirable and sought for by all open-hearth operators, we believe the greatest benefit to be derived from this type of control is the increased ability to maintain a greater degree of uniformity of product and the increased metallurgical knowledge resulting, since this control is predicated on early determinations of slag and bath characteristics.

Map Shows Location of Portland Cement Plants

Map of Portland Cement Plants of the United States; available in three sizes, 22 x 17 inches, 44 x 34 inches and 66 x 48 inches; paper, cloth back, panel board back or roll type; published by J. H. H. Muirhead, New York; supplied by STEEL, Cleveland, at prices ranging from $1 to $10; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This 1935 map, revised from an earlier edition and redrawn, shows the location of all cities, towns and villages having portland cement plants and lists the companies operating in each place. A notable improvement is that the complete name of each portland cement company is given; abbreviations are reduced to a minimum. Where two names are given, the second is that of the holding or operating company. When necessary, names of railroad stations are followed by names of postoffices serving the plant.

A dominant feature of the new map is the prominence given to the 12 districts or divisions of the country as established by the United States bureau of mines. Each district is heavily outlined and in the cases of the colored maps is further emphasized by bright oil color. The list of plants is arranged in accordance with these districts so that the western plants are named on the left of the map and the eastern plants on the right-hand side.

Report on Original Research In Use of Industrial Gas

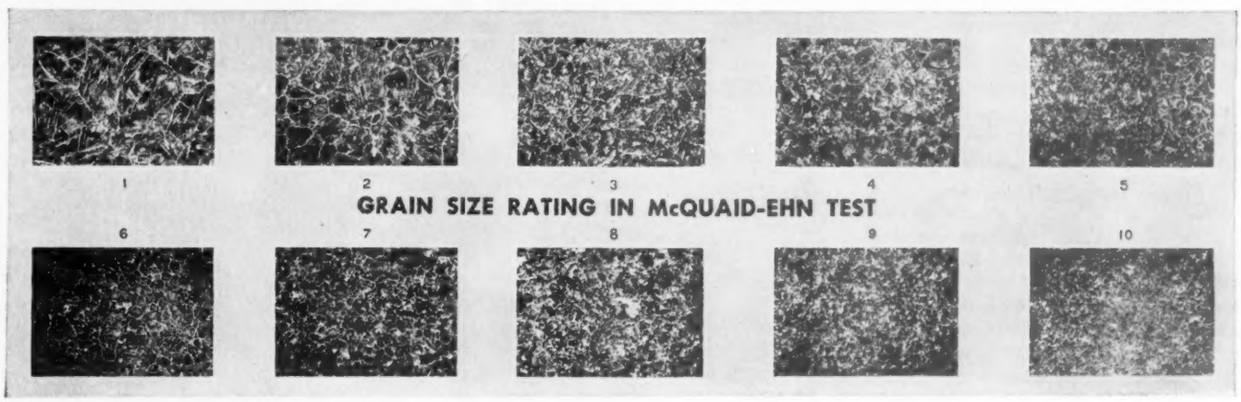
"Research in the Effect of Operating Temperatures on the Combustion of Industrial Gas" is the title of a 77-page report by the American Gas association, 420 Lexington avenue, New York. It is the second report of results of original research work in this subject at the association's testing laboratory at Cleveland. The first report, issued in August of 1934, was confined primarily to a presentation of fundamental information relating to a study of combustion chamber wall temperatures, and included descriptions of the test equipment and procedures utilized.

The second report, just issued, contains considerable original information concerning a large number of variables influencing the operating temperatures and combustion of industrial gas. Inasmuch as all investigation work involved studies of furnaces operating with oxidizing atmosphere only, the data presented are applicable exclusively to this one phase of industrial furnace operation.

In many instances a direct application of the results obtained may be made to practical industrial applications, although the possibility of so doing is precluded in several cases by the fundamental nature of the research. The contents of the report may be regarded as a distinct contribution to the fund of knowledge underlying the continued development of more efficient industrial heating equipment.

11 *Years Ago—*

REPUBLIC ISSUED THE *first* GRAIN SIZE CHART



(Grain size chart issued by United Alloy Steel Company, now a unit of Republic Steel Corporation)

BACK IN 1924, United Alloy, now a unit of Republic Steel Corporation, issued its first grain size chart. To the best of our knowledge, this was the first grain size chart ever issued to industry.

In the eleven years that have elapsed, Republic has made thousands and thousands of tons of quality carbon and alloy steels to the rigid grain size requirements of many of industry's largest and most critical buyers of fine steels.

With the most completely equipped metallurgical laboratories in America, Republic Metallurgists are always interested to discuss grain control and the effect of grain on the quality and performance of high grade steels.

Republic Steel
CORPORATION
CENTRAL ALLOY DIVISION, MASSILLON, OHIO
GENERAL OFFICES: YOUNGSTOWN, OHIO

Chicago Engineers Consider Applications for Castings

DEVELOPMENTS in the foundry industry in improving the qualities of cast ferrous metals and in enlarging their engineering applications were described at a joint meeting sponsored by three Chicago engineering societies and held in that city, March 18. An audience of about 450 attended. Co-operating in holding the meeting were the Chicago section, American Foundrymen's association, Western Society of Engineers, and the Chicago section, American Society of Mechanical Engineers. H. F. Allen, Link-Belt Co., Chicago, presided.

The subject was presented in the form of three papers, delivered by authorities in the gray iron, malleable iron and steel castings industries. Due to time limitations, each was confined to treating the important features of properties and uses of the various metals.

Future of High-Test Iron

Gray iron was discussed by H. Bornstein, Deere & Co., Moline, Ill., who described briefly common practices in production of such castings. While pointing out that the majority of gray iron castings made today still are plain carbon material, he emphasized the growing importance of alloyed iron for many engineering applications. Such alloys include nickel, chrome and molybdenum. Increased use of these and other alloys was predicted. In discussing high-test irons, Mr. Bornstein related that several years ago few foundries could meet tensile strength specifications of 50,000 pounds per square inch, while today 60,000 pounds and higher commonly is attained.

The speaker's address was illustrated by slides showing various castings applications, including automotive camshafts and crankshafts, brake drums, forging dies and piston rings. In connection with crankshafts, the ability of cast iron to absorb vibration was given as an important advantage for its use in production of such parts.

Malleable iron castings have a definite field of application, where they enjoy certain superiorities over other cast or rolled metals, stated D. P. Forbes, Gunite Foundries Corp., Rockford, Ill. Malleable iron has a uniform tensile strength ranging from 50,000 to 60,000 pounds per square inch, but has a yield point which is a high percentage of the ultimate strength. Because of its combined qualities of high strength, resistance to shock and ease of machinability, malleable iron finds many uses in the automotive, railroad, agricultural equipment and miscellaneous industries, Mr. Forbes indicated.

On automotive vehicles, such parts as the front hub, pedals, spring brackets, differential carriers and cases, brake parts and numerous brackets, levers and supports on the chassis and motor commonly are malleable castings. The tendency in the automotive industry the past few years has been for an increasing use of malleable iron despite inroads of stampings, forgings and die castings.

Mr. Forbes pointed out that malleable iron is best suited for castings of light sections and on some heavier castings it becomes an optional material, yet it finds extensive use for railroad equipment parts. For applications on agricultural machinery, corrosion-resisting properties of malleable iron offer an additional advantage over some other materials. Miscellaneous uses of malleable iron are numerous, some of these being lawn mower gears, conveyor chain, pipe fittings, bolt anchors for cement construction, bridge railing panels, fence fittings, manhole covers, small machine tool parts, electrical outlet boxes, cable clamps, barrel plugs and a wide variety of machine parts.

Material Other Than Malleable

"Advancements in metallurgy have disclosed that the same process which forms malleable iron will form other valuable products if the method of manufacture is varied," Mr. Forbes stated. "Products have appeared which are similar to malleable iron, except that they contain up to 0.80 per cent combined carbon, as against practically none for malleable iron. The utility of these products is very great since care in manufacture will permit of high tensile strength with a reasonable ductility. A typical example of such a material would have a tensile strength of 90,000 pounds per square inch, a yield point of 70,000 pounds and elongation of 16 per cent in 2 inches.

"The field of usefulness for such metals never has been adequately explored but it is probable they will invade the present field of forgings, steel castings and malleable iron. The handicap at present is the necessity for expensive equipment for the accurate heat treatment required to obtain uniformity." In later discussion, Mr. Forbes said that welding of malleable iron is being carried out successfully, the electric arc usually being employed.

A resume of progress in the steel castings industry during recent years was presented by A. N. Conarroe, National Malleable & Steel Castings Co., Melrose Park, Ill. The speaker described the work which has been done in studying and improving steel foundry practice, detailing various methods of heat treatment as well as the effect of alloys on physical characteristics of castings. Properties of vanadium, manganese, chromium, molybdenum, tungsten and nickel steels were listed. Developments in heat treatment and in alloying of steel castings have done much to enlarge the usefulness of the metal, Mr. Conarroe indicated.

Using Steel for Strength

Due to the high yield strength of steel castings, they can be used to replace structural members successfully with a material saving in weight for the same condition of service or the loads may be increased for the same size of section, when properly designed, he pointed out. Castings should be designed with a view for strength and reliability rather than for their esthetic appeal.

The possibility of substituting integral castings for fabricated structures is shown in the cast locomotive frame, although the speaker warned against carrying size and complexity too far.

Corrosion-resisting steel castings, alloyed principally with chromium and nickel, were discussed, including the principal applications of the various mixtures.

An exhibit of modern castings, furnished by leading foundries of the Chicago district, proved an interesting feature of the meeting.

Design Changes Made To Improve Stoker Operation

Several changes in design and construction of its domestic stoker have been effected by the boiler and stoker division of the Peerless Mfg. Corp., Louisville, Ky. The new design, built in capacities furnishing 30, 60, 90 and 120 pounds of coal feed per hour, embodies a ratchet drive instead of the former hydraulic drive; is equipped with a shearing pin; and has a round retort instead of the former square shape.

All castings exposed to flame are of low-carbon heat-resistant gray iron. Fan is fully enclosed in a steel housing. Air control is automatic after adjustment is made to suit the installation. Fuel hopper is of copper-bearing steel to insure long life.

INCENTIVES OR DAY WORK?

BY C. G. JOHNSON
Time Study Department
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

RELATIVE advantages and disadvantages of day work and incentive systems have been widely discussed recently. Advocates of each system have advanced many arguments for the system they think is best. It is realized that where the output is not controlled by the operator's skill and effort, as in the conveyor systems used in the automotive industry, an incentive system is not necessary for maximum production. However, where output depends largely upon the skill and effort of the individual workman, it is felt that an incentive is desirable.

Incentives have been used in the Westinghouse organization for a number of years, resulting in marked benefits to both employes and the company. The following arguments for an incentive plan, and the advantages of a time base over a money base are a result of discussions held by the time-study supervisory force.

The abolishment of the present plan, would leave only two alternatives. The first would be to revert to a day work basis, and the second to install another system of incentive wage payment. There is no apparent justification for reverting to a day work basis. Such a step would be one taken in the wrong direction and would partially render useless the data which have been collected by the time-study department over a period of years. Most manufacturing concerns recognize today, more than ever, the necessity for accurate information on production costs and the control of costs by measurement.

Gives Better Ideas of Costs

An incentive system is the basis for all accurate cost systems. Actual labor costs established upon records obtained from day work operators vary inversely as the volume of work. It is impossible to control entirely the human element and there is a tendency to vary efforts according to the amount of work which must be done. This is noticeable even with an incentive system. Control without measurement is difficult if not impossible to attain.

Modern industry is becoming more and more competitive. The regulating codes which came with NRA established minimum wage scales and selling prices based on costs. Assuming constant material values, if the labor element of cost cannot be reduced directly, the only means left to reduce costs is by reduction of the overhead, or by the improvement of manufacturing methods. The analysis and improvement of methods is an integral part of any good incentive system. Without incentives, factory costs and consequently selling prices in one plant compare unfavorably with those in another plant where they are used.

Broad Functions Involved

An incentive system does not involve merely a time allowance established for all work being performed. In addition to planning work and establishing time values for necessary operations to produce a given product, the time-study man furnishes estimates to the sales department for negotiations on new work, comparative cost data to the engineering department on contemplated changes in design, comparative cost data for cost analysis work, and is continuously on the alert to effect cost reductions, improvements in methods, materials and the like. The information the time-study department is able to give to other departments is made available through the functioning of an incentive system.

Workmen prefer to work under an incentive system rather than a day work system. During recent months of reduced activity it was found desirable in certain cases to discontinue temporarily the incentive plan in force. This resulted in strong objections from the employes affected on the grounds that they were deprived of an opportunity to increase earnings through an extension of effort. With incentives, workmen feel they are getting paid in proportion to the effort they expend and the company benefits through increased production and lower unit labor costs with a minimum of supervision.

Some have thought that by the elimination of the incentive plan, the amount of bonus paid would be a direct labor saving to the company. This would be true if it were conceivable that the operators would maintain the same performance efficiency on a day work basis of payment that they have maintained under the stimulus of an incentive plan. Statistics compiled from an extensive survey of manufacturing industries indicate day workers, in comparison to incentive workers, are less than 50 per cent efficient. On this basis it would require a 100 per cent increase in employes and productive facilities to meet a given amount of production.

More than 70 per cent of the total hours worked by hourly paid employes in the Westinghouse organization is controlled and paid for on the basis of measured tasks. After the time for operations such as clerical work on an hourly basis, crane and elevator operators, policemen and the like is deducted from the total hours paid from an hourly basis, the result is about 95 per cent which is paid for and controlled on the basis of measured time.

Piecework vs. Time Base

Next the relative merits of a time base and a money base will be considered. The term "piecework" will refer to an allowance made in terms of money. Piecework is the oldest form of incentive wage plan. Expressing allowances in time units was a later development which has superseded piecework in a large majority of cases.

Whether the allowance is expressed in money or in time, the time standards should be the same and, for a given performance, an operator should be able to make exactly the same wages under either system. In other words, both time rates and

(*Please turn to Page* 54)

And Now—Maximum SLIP INSURANCE *with* MULTIGRIP FLOOR PLATE *at no greater cost*

● Here's the latest, safest floor plate design—Non-Skid from all angles. It can save many a costly slip—without extra expense. MULTIGRIP Floor Plate footings make working conditions less hazardous. And if you use safety plate on equipment you manufacture—it will prove an effective selling advantage. Illinois Steel has engineered a real improvement. Write us for complete data on thicknesses, weights, etc.

Easier on the Feet	Non-Skid from All Angles
Easier to Clean	Most Modern Appearance
Quicker Drainage	Cuts Economically

Good Traction for Wheeled Vehicles

ILLINOIS STEEL COMPANY

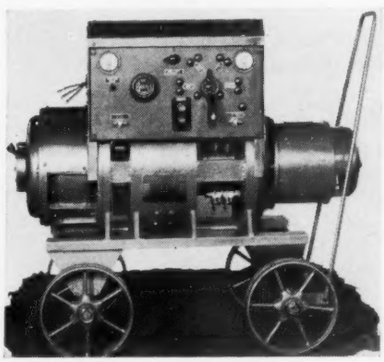
208 SOUTH LA SALLE STREET, CHICAGO, ILLINOIS

United States Steel Corporation Subsidiary

NEW EQUIPMENT

Electric Arc Welder—

Universal Power Corp., Cleveland, recently introduced an arc welder, shown herewith, as another forward



Ease of control is feature of new Universal arc welder

step in welder design for staid and steady dependable arc welder performance. Easy control of welding current is provided in a total of some 600 welding current settings. The machine easily delivers its full welding range under the proposed new standards of N.E.M.A., whether the welder is started cold or has been thoroughly warmed up in heavy welding service. The entire welder is ruggedly built for hard usage.

♦ ♦ ♦

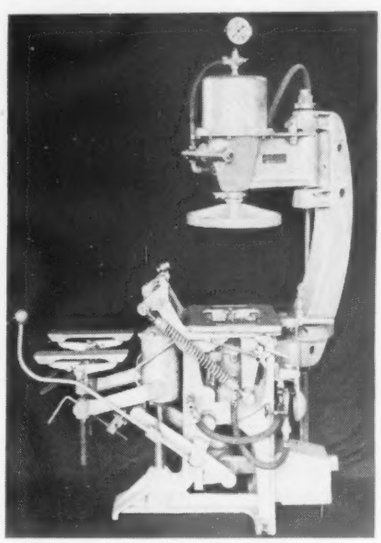
Electrical Contact Button—

General Plate Co., 31A Forest street, Attleboro, Mass., has developed a new electrical contact button made of silver backed up with steel. These new buttons can be furnished with suitable projection areas on the back which faciliate spot welding the buttons to support members of steel, brass or copper and reduce assembly time. It is further stated that this type of button does not lose its shape even when contacts vibrate and pound together. They are made with flat or dome contact faces, in all sizes.

♦ ♦ ♦

Foundry Molding Machine—

Tabor Mfg. Co., 6225 Tacony street, Philadelphia, has introduced a plain-jar squeeze, rollover and pattern draw molding machine, as shown in the accompanying illustration. This unit has a cable 14 inches wide, with an overhead squeeze cylinder 10 inches in diameter. The pattern draw of the machine, which is 8 inches is designed especially to provide a perfect draw of that amount, regardless of wear. Due to a sand proof roller bearing guide, it is claimed that the wear will be exceptionally slight. The machine is



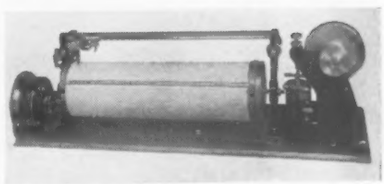
Tabor plain-jar squeeze, rollover and pattern draw molding machine

equipped with vibrator, pressure gage and blow valve.

♦ ♦ ♦

Stress Strain Recorder—

Baldwin-Southwark Corp. Philadelphia, recently brought out a weight motor type of stress strain recorder, primarily for application on the Baldwin-Heydekampf type of testing machine, but by adaptation available on other types of testing machines. In this device, shown here-



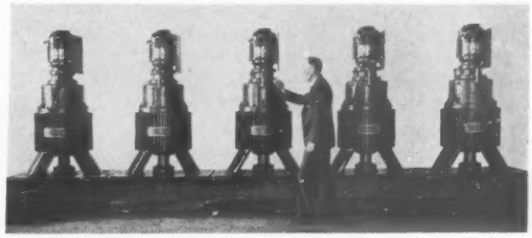
Baldwin-Southwark weight motor type stress strain recorder

with, the load movement of the recording device is directly controlled from the load indicating mechanism while the strain motion is controlled through a Goodyear Zeppelin or Templin type extensometer, a sensitive relay and solenoid-actuated brake which controls the fall of a weight, hence "weight motor." The records from this stress strain recorder can be made nearly equal to those from the Southwark - Emery Type in smoothness and accuracy. The limiting factor in the shortening of the lengths of the steps of the record is the adventitious variation of the friction in the mechanism of the drive of the recording unit.

♦ ♦ ♦

Agitator Drives—

Patterson Foundry & Machine Co., East Liverpool, O., recently developed a group of unique drives for a large chemical company. The five units shown in the accompanying illustration are part of a shipment of fourteen. Despite their size they are only five horsepower units. They are driven by 1800 revolutions per minute motors and have an output speed of 1 revolution per minute on the output shaft, representing an 1800 to 1 reduction. For transmission of five horsepower, the output shaft is 5 inches in diameter. The unit was supplied for driving agitators in liquid mixing tanks. The entire suspended load and the thrust of the agitator totalling ap-



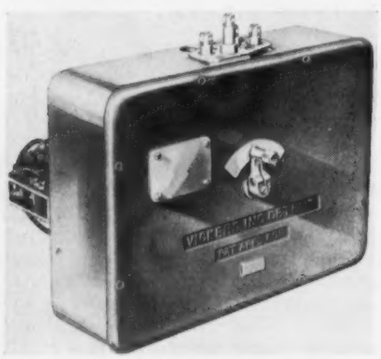
A group of drives developed by Patterson Foundry & Machine Co. for driving agitators in liquid mixing tanks

proximately 5000 pounds is carried on a tapered roller bearing inside the reducer unit. These units employ the gearless reduction principle, operate at a comparatively high efficiency with little noise and no vibration and are equipped with oilless guide bearings in the base to prevent shaft vibration or distortion and to protect the reducer bearings above, the manufacturer explains.

◆ ◆ ◆

Electric-Hydraulic Control—

Vickers Inc., Detroit, is bringing out an electric-hydraulic control panel which provides practically every possible combination of automatic feeds and rapid traverses for machine tools and other equipment. Starting, reversing and stopping are controlled electrically by push buttons or limit switches, relays and



Vickers electric-hydraulic control panel for machine tools

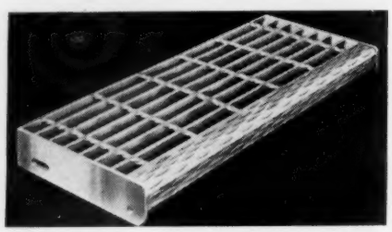
solenoids built into the control panel, shown herewith. A synchronous time relay which is varied easily by simply turning a dial in the panel, provides delayed reverse.

Different kinds of feed rates and rapid traverses are controlled hydraulically, being increased or decreased by stops (on work table) that depresses one or the other of the two center plungers. Length of any working stroke or rapid traverse may be varied at any time by changing the position of the stops. A lever provides manual control for set up purposes. Changes in work resistance or operating pressure of hydraulic system do not affect feed rates; consequently tool jumping and overfeeding are prevented. The panel provides a complete hydraulic circuit except pump and cylinder. It is flush mounted with gasket and requires no pipe connections. Several types and sizes are available.

◆ ◆ ◆

Stair Tread—

Blaw-Knox Co., Pittsburgh, has announced that its stair tread now is manufactured using a nosing made from rolled diamond checkered plate. This nosing is made to withstand



Blaw-Knox stair tread uses rolled diamond checkered nosing

abuse, particularly that given to treads when buildings are under construction. It defines the edge of each tread because of the definite contrast between the checkered plate and the grating construction.

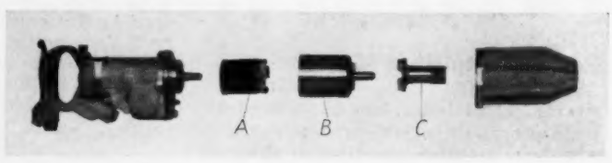
The stair tread is made from electroforged steel grating. The intersections of the bars are electroforged into one piece under enormous pressure. The twisted crossbar feature of the grating affords maximum safety as the roughened surface of the twisted bar affords a grip for shoe soles which makes slipping practically impossible even if the tread is wet, greasy or icy. Construction of this stair tread, shown herewith, lends itself to extreme cleanliness and to complete protection with paint or galvanizing, eliminating the possibility of corrosion.

◆ ◆ ◆

Impact Wrench—

Ingersoll-Rand Co., Phillipsburg, N. J., is marketing the Pott impact wrench which eliminates the necessity of hammering caps and nuts in order to loosen them. A rubber member known as an accumulator, designated *A* in the accompanying illustration, is interposed between an air motor and a chuck. In operation torque from the motor is applied to the rubber accumulator which, in becoming shortened through twisting lifts the hammer *B* from engagement with anvil *C*. As soon as the hammer is released the untwisting of the rubber block spins the hammer forward to the next engagement, thus delivering a powerful twisting blow to the anvil, on the end of which the chuck is attached.

These torsional impacts, occurring at the rate of 1200 to 1400 blows a minute, exert a powerful turning effect. One man operates the wrench with ease, the accumulator absorbing the torque and eliminating the danger of shock or injury to the operator .

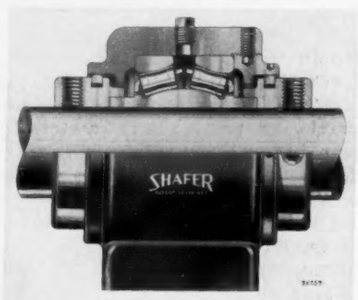


Impact wrench introduced by Ingersoll - Rand Co.

◆ ◆ ◆

Bearings Have Piston Ring Seal—

Shafer Bearing Corp., 6563 West Grand avenue, Chicago, have announced that a new piston ring seal and square collar design now is employed in its standard duty pillow blocks and self-aligning roller bearings. The inner bearing race, shown herewith, is not notched but has four flats on the outer diameter which are engaged on each side by corresponding flats on the inner diameter on two locking collars used. Each collar has two set screws and carries a piston



Shafer self-aligning bearing embodies piston ring seal

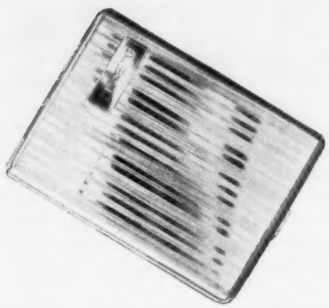
ring which provides an effective seal, adequate for all dirt, dust and water conditions excepting the most extreme.

The piston ring seal in standard duty roller bearings is furnished only on units which contain double row radial-thrust roller bearings. These bearings are inherently self aligning.

◆ ◆ ◆

Pneumatic Trolley Lubricator

J. N. Fauver Co., Detroit, has placed on the market a pneumatic trolley lubricator designed to provide



Cigarette case manufactured from Acme Superstrip. Let us show you how this metal with flawless finish can give your products greater beauty.

Illustrating the mirror-like surface of Acme No. 3 Finish Superstrip

FLAWLESS FINISH IS OBTAINED WITH ACME SUPERSTRIP—PLANNED AND ROLLED FOR YOUR PRODUCT

● Is finish an important factor in your product? If so, Acme Superstrip is *your* strip steel.

To manufacturers of articles requiring particularly fine finish — plain or special — Acme Superstrip can meet those requirements.

Upon the rolls depends the finish. And here is where Acme Superstrip steps out from the crowd. There is no trick to it— simply unsurpassed skill in operating the rolls, and the finish of the rolls themselves.

From the original planning, to the method of packing for shipment, the Acme Superstrip you buy is *your* strip steel.

The best proof of this unmatched quality is the list of nationally known products made from Acme Superstrip.

Send for the new booklet "Batting 'Em Out," telling about better products with Acme Superstrip. No obligation. ACME STEEL COMPANY, General Offices: Chicago. *Branches and Sales Offices in Principal Cities.*

Acme Superstrip

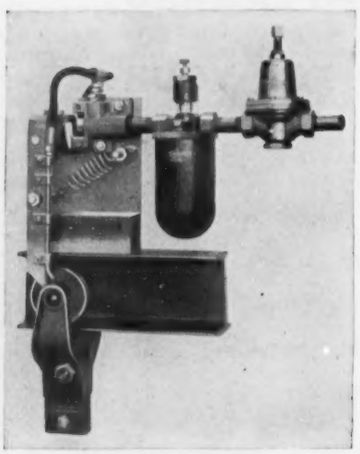
HOT ROLLED • COLD ROLLED — The ACME of STRIP STEELS — GALVANIZED • STAINLESS

ACME STEEL COMPANY, 2826 Archer Avenue, Chicago
Send me your new booklet, "Batting 'Em Out."

Name.....
Firm.....
Street.....
City.....State.....

proper and economical lubrication of trolley bearings of overhead trolley conveyors. Plant air pressure is reduced by a standard reducing valve to operating pressure. The air then passes through an air line lubricator which introduces into the air stream, a drop at a time, lubricating oil of the proper viscosity. Thus a fog of oil leaves the air line lubricator and is applied under air pressure to the trolley bearings. The bearing lubricator, shown herewith, consists of a unit built of cold rolled steel, attached by four machine screws to the top of the conveyor rail.

As each trolley passes under the



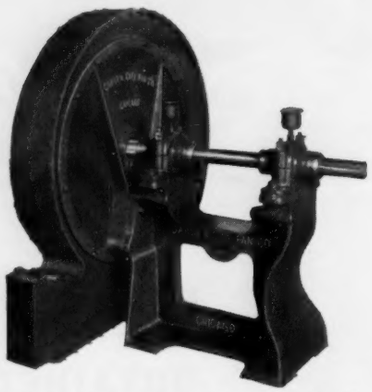
Pneumatic trolley lubricator marketed by J. N. Fauver Co.

lubricator, it trips a pair of triggers which automatically (by actuating the blow valve) releases jets of fogged oil, forcing the lubricant directly into the bearings. Air pressure, oil volume and direction of jets are readily adjustable. The energy required to operate the device is supplied by the moving trolley. Oil storage capacity is 1½ pints.

♦ ♦ ♦

High Temperature Fans—

Garden City Fan Co., 332 South Michigan avenue, Chicago, recently developed a line of fan equipment for handling air at high temperatures. These units, one of which is shown herewith, are suitable for circulating air in furnaces and ovens, resulting in uniform heat distribution, increase in production and improvement in the quality of the material handled. They are fitted with patented air cooled shaft which prevents the heat from being transmitted to the bearings and permits the use of expanding type ball bearings entirely eliminating the use of water cooling. The new units are available in all sizes ranging in



High temperature fan developed by Garden City Fan Co.

capacity from 500 to 50,000 cubic feet per minute, and in a temperature range from 100 to 1400 degrees Fahr.

♦ ♦ ♦

Hydraulic Internal Grinders—

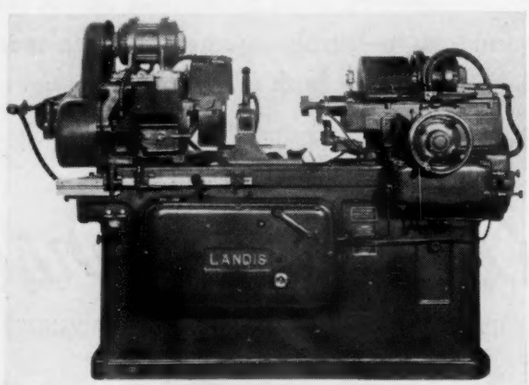
Landis Tool Co., Waynesboro, Pa., has entered the production internal grinder field with its new type C hydraulic unit, shown herewith. These internal grinders may be used for rapid production grinding of similar parts within a close degree of accuracy and are so flexible as to serve with equal efficiency for the small lot grinding of a wide variety of work. Two sizes are offered. The 15 x 8-inch size is recommended for the grinding of smaller bores and has as its outstanding features the Landis-Solex sizing device and a hydraulically reciprocated grinding wheel fixture. The 15 x 11-inch size is for the deeper bores. The former may be furnished as a plain machine, that is, without automatic sizing or hydraulically reciprocated grinding wheel fixture, when rapid production grinding does not have to be performed. On the other hand, the latter is only supplied with these two high production features on special order.

The sizing device is responsible for the close consistent accuracy of the machine. It functions during the entire grinding cycle directly from the work diameter. As a consequence, such variables as wheel wear, difference in amount of stock to be removed and spring in the grinding wheel quill do not affect its accuracy. It may be used for any straight or tapered hole, whether blind or not. With equal efficiency it will size many splined, key-wayed or interrupted holes.

When grinding bores 2¾ inches in depth, or less (and most bores ground on a high production basis fall within this range), the grinding wheel fixture is hydraulically reciprocated. In other words, a relatively light weight mechanism is reciprocated and when reciprocations are short and rapid, such as in the case of internal grinding, there is great smoothness of traversal and reversal. A massive bridge type bed section supports the wheel base and grinding wheel fixture, thereby further eliminating vibration. Bores having a depth greater than 2¾ inches are ground by hydraulically reciprocating the work table.

Another feature of importance is the grinding wheel quill spring compensating device. As a result of its use the cross feed automatically compensates for any spring in the grinding wheel quill, thereby effecting great wheel economies. Bores having steep tapers with angles up to 90 degrees may be handled on the standard machine. Extreme care has been exercised in order to make all valves, piping and connections easily accessible for inspection.

OPERATION of this Landis hydraulic internal grinder is semi-automatic in that many of the movements take place automatically during the grinding cycle. Manual operations are performed normally during automatic machine movements



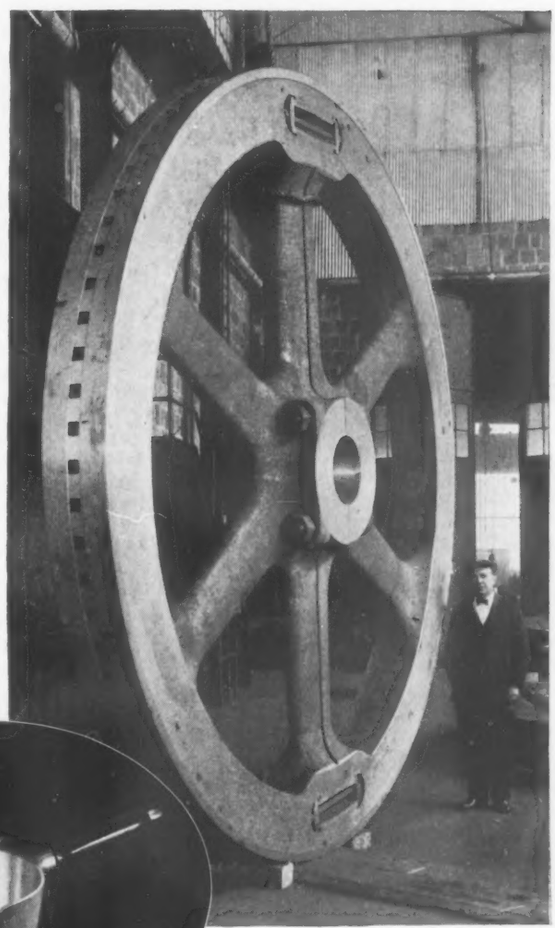
NEW DEVELOPMENTS IN METALLURGY

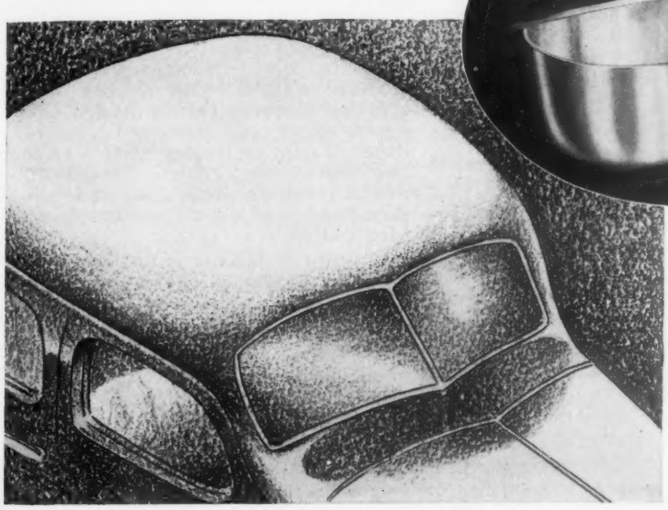
Facilitated by TAMCO *Research*

Recent research, both in the TAMCO Laboratories and in Industry generally, point to the intrinsic merits of Titanium as an *alloying element* in steels and other metals. Originally introduced commercially as a cleansing and deoxidizing agent—TAM *Original* FCT (Ferro Carbon-Titanium)—new developments in metallurgy reveal Titanium compounds as effective means for improving quality and obtaining desirable physical properties.

One of its desirable "alloying" effects is to age-harden certain metals, particularly copper. Another effect is its stabilizing influence on carbon—virtually removing it from normal active form by locking it up as Titanium carbide and rendering its properties ineffectual in the containing metal. Still another alloying effect is the ability of Titanium to prevent intercrystalline embrittlement or corrosion in the 18-8 stainless steels. And again, is its application in refining the grain of many metals, especially aluminum castings, with resultant increase in toughness of the material and better quality.

TAM Metallurgical Alloys include quality-improving materials for practically all phases of the ferrous and nonferrous metal industry—TAM *Original* FCT for forging steels; TAM *Low Carbon* FCT for sheets, strip and deep stamping stock; TAM *Aluminum Reduced* Low Carbon Ferro Titanium for stainless and plain chromium steels; TAM *Standard* Low Carbon Ferro-Titanium for cast iron; TAM Webbite for aluminum — to name but a few. A practical TAM Engineer, with the complete facilities of the TAMCO Research Laboratories and staff at his disposal, will willingly call and explain TAM applications of interest to you.





Above: *This giant gray iron casting owes its strength, in part, and its grain refinement, to TAM Standard Low Carbon Ferro Titanium.*

Oval: *A cast aluminum saucepan made better by TAM Webbite.*

Left: *Today's "turret tops" are stronger, safer, because of TAM Low Carbon FCT, the outstanding deoxidizer for steel strip.*

THE TITANIUM ALLOY MANUFACTURING CO.

General Offices and Works:
Niagara Falls, N. Y., U. S. A.

Executive Offices:
111 Broadway, New York City

Canadian Representatives
Railway & Power Eng. Corp. Ltd.
Toronto, Montreal, Hamilton,
Winnipeg, Vancouver, Sydney

European Representatives
T. Rowlands & Co., Ltd.
23-27, Broomhall St.,
Sheffield, England

Pacific Coast Representatives
Balfour, Guthrie & Co.
San Francisco, Los Angeles, Portland, Seattle, Tacoma

Incentives or Day Work?

(*Concluded from Page 47*)

money rates should be established by time study. In any incentive wage system, the operators should be guaranteed a minimum daily wage.

Careful study will disclose that a time unit plan is more flexible under a majority of conditions than the piecework plan.

With a time unit plan, wage adjustments have no effect on a time value. All time records remain the same and the adjustments are made in the hourly rates.

The difficulty encountered when a change in the labor market makes an adjustment in piece rates is probably the foremost objection to piecework. The importance of this point is great or small depending on the number of rates involved and the frequency with which changes are likely to occur.

The exchange of information between departments and work is simplified when time standards are used instead of piece rates as differences in wage levels are adjusted automatically.

In addition to forming the basis for the payment of wages, time allowances are used in scheduling production, in planning manufacturing layouts, tools, fixtures and the like, and are the best basis for modern accounting procedure.

In order to assure the payment of labor on the basis of the skill, ability and experience required for a class of work, a job classification plan is a necessary part of any wage system. However, it is found necessary at times to use young men on an operation done on night-turn which during the day turn falls in the women's class. Here again the inflexibility of piecework crops out since it would be necessary to use a higher piece rate for the men on night-turn than would be allowed the girls. Likewise, if to aid in a temporary production rush, certain operators are placed on work of a lower class, an objection likely would arise unless special piece rates were allowed. On the other hand, piecework automatically prevents increased labor costs during low activity periods when high rated operators are permitted to work on low rated work in an attempt to distribute available work evenly.

From the psychological viewpoint several items should be considered. First is the simplicity of the piecework system from the workman's viewpoint. To take a certain number of pieces and multiply them by a specified price per piece is a simple calculation for anyone. However, it is not always as simple as this; on an individual basis, yes, where groups are used, no. The distribution procedure under group piecework is just as complex, if not more so, as it is with time unit plans.

It has been claimed that output is restricted more under the piecework system than under a time allowance system. It is not known just why this is true and it may not be true in all cases but it is claimed to have been proved in test cases.

It is often more embarassing for rate setters to discuss wages and money with the operators than it is to discuss time. Sufficiency of wages should not be the responsibility of the rate setters. Different operators probably would react in different manners, but the human element should be kept in mind always.

Basing Point Issue Quiets

(*Concluded from Page 11*)

ducers required to quote prices f.o.b. mill.

Smaller producers outside the Chicago area, however, strongly oppose any plan prohibiting them from equalizing their prices with other f.o.b. mill quotations, since this would curtail their markets considerably. As pointed out by the Continental Steel Corp., Kokomo, Ind., the large companies have plants at different points over the country, including the large consuming centers, and would not be affected by the single f.o.b. mill price plan such as would the small producer having only one or two mills.

The group mill base system has some supporters among producers here, and a limitation on freight absorption also is looked upon with a certain amount of favor.

In this connection, however, the Granite City Steel Co., Granite City, Ill., calls attention to the fact that adoption of an f.o.b. mill basing plan would curtail long-distance hauling of steel with an adverse effect on buying power of the railroads.

NEW YORK—While the trade in the East regards any major change in the price basing system as being far from an actuality, it nevertheless is giving serious thought to the possibility and subsequent effects.

In general, producers, and, in a lesser degree, consumers believe there is no necessity for drastic change and deplore particularly that such agitation has to come at this time with its unsettling influence on an already depressed state of business.

As it would apply to the East, a change to an f.o.b. mill basis would probably set up more additional basing points than in any section of the country, it is believed. There are numerous basing points, but far more products are actualy produced.

For instance, on commercial steel bars, sheets, strip, tin plate, black plate, ternes, pipe, reinforcing bars, and various descriptions of wire and semifinished steel, there are no basing points east of Pittsburgh and Buffalo. Yet, except for certain descriptions of the light flat-rolled products, most of these products are produced in the East.

However, that there is no eastern base on many widely used products is said to be due in good measure to the fact that output in the East is limited in many instances to too few companies. Even consumers who would be supposed to benefit by a change to a mill base system have shown no particular interest for this reason, it is declared.

On the other hand, the picture would be little changed with regard to pig iron and iron products, such as bars and semifinished iron. Most pig iron producing points that have been active in recent years are now basing points, and as for iron products, there are more basing points in the East than anywhere else, and most producing points are bases.

As for plates and shapes, two additional basing points would probably be considered for each—Harrisburg and Johnstown, Pa., on plates, Pencoyd and Phoenixville on shapes.

While there are few consumers who would like to see a sweeping change to a strictly f.o.b. mill basis, there are those who would like to see certain modifications. For instance, eastern forging manufacturers, would like to see a base on forging billets set up in the East and upon occasion there has been similar agitation among steel bar users.

PITTSBURGH — Opinions of principal steel executives here on the basing point reports summarize thusly:

"There is nothing new in the trade commission's gunning. We feel we speak for our customers also in a qualified manner when we say that the basing point system under the present steel code imposes no injustices. To throw it over at this time and replace it with any makeshift would result in confusion, unnecessary detail, and all without any basic justification."

Pittsburgh feels it is not going to lose its present markets regardless of any federal ruling in any form. Since no steel mill disposes of all of its output at its nearest consuming point, each must go abroad to sell at least part of its production. There would, of course, be a tendency to localize markets and this would work as great a hardship upon the consumer as the producer.

Slower Trend in Market; Steel Rate Now 46

Structural, Tin Plate

Tonnages Heavier;

Others Down

> ***THE MARKETS IN TABLOID***
>
> ***DEMAND*** . . . *Quieter, except structural shapes, tin plate.*
>
> ***PRICES*** . . . *Iron and steel steady; scrap lower.*
>
> ***PRODUCTION*** . . . *Ingot output off 2 points to 46%.*
>
> ***SHIPMENTS*** . . . *Further moderate decline.*

AWARDS of 54,120 tons of structural shapes, another substantial increase in automobile production, and an advance in tin plate output to 85 per cent last week were insufficient to compensate for a general decline in forward buying, the net result being a 2-point drop to 46 per cent in steelworks operations.

Producers, completing the best first quarter since 1931, see a strong probability of an early reversal in the present trend, and possibly a new peak in operations this spring as more structural and railroad work matures. Uncertainty, however, is apparent in the attitude of the rank and file of steel consumers.

Shipments of flat rolled steel products have not diminished appreciably so far, but mills are not receiving replacement orders, and their backlogs April 1 will be considerably lighter than three months ago. Neither producers nor consumers now have the problem of replenishing stocks. Some purchases, apparently are being deferred in expectation the government attack on the steel basing point system may be a break for the consumer.

Automobile assemblies last week totaled 100,000, a gain of 3000. One leading manufacturer has finished parts on hand for 60 days, a few for 30 days . While new specifications from automobile manufacturers have dropped for the second consecutive week, present orders for cold-rolled material cannot be delivered before seven to eight weeks, and in some instances nine weeks, indicating that the bulk of buying by the industry for the first half has been done.

In tin plate, mills still are adding to backlogs from container manufacturers. If obsolete tin mill capacity were to be disregarded, they could be considered as producing at 95 per cent. Actual output is close to a record for March.

Shape awards for the week were inflated to the largest tonnage since the first week in May, 1933, by the placing of 33,000 tons for New York's Triboro bridge; 10,000 tons for Bethlehem Steel Co.'s sheet mill building in Lackawanna, N. Y., and 6000 tons for the Tennessee Valley authority's hydroelectric projects. More public projects are developing, but the outlook for tonnage from this source in the next three months is not as favorable as a year ago. The government is slower with relief.

One of the most uncertain elements in the market from steel producers' standpoint is the probable extent of railroad buying this year. Unsettled questions pertaining to freight rates, pensions, government policies have practically paralyzed railroads' steel purchasing activities. Gulf, Mobile & Northern has placed 3918 tons of rails and fastenings, Chicago, Burlington & Quincy one stainless steel diesel electric train.

Central Railroad of Brazil has awarded a $15,000,000 electrification project to Metropolitan-Vickers Ltd., England. STEEL's London correspondent cables British import duties on steel have been raised to 50 per cent from 33½.

Scrap shipments on old orders are holding up, but new demand and prices are lower. Pig iron releases continue to increase, the gain due mainly to requirements by the automobile industry, which is contributing to the surplus of scrap, depressing scrap prices. Coal and coke producers are indifferent to strike threats, having heavy stocks. Lake ore shipments this season are being estimated at 30,000,000 tons, up 35 per cent.

Steelworks operations last week declined 4 points to 47 per cent at Chicago; 3 to 35, Pittsburgh; 2 to 70, Cleveland; 1 to 37, Buffalo; 2 to 51, New England. They advanced 2 points to 60 at Youngstown. Wheeling held at 92; Birmingham 55½; eastern Pennsylvania 28, and Detroit 88.

STEEL's iron and steel price composite is down 5 cents to $32.33, while the finished steel composite is unchanged at $54. The scrap index is off 5 cents to $10.46.

COMPOSITE MARKET AVERAGES

	March 23	March 16	March 9	One Month Ago Feb., 1935	Three Months Ago Dec., 1934	One Year Ago March, 1934	Five Years Ago March, 1930
Iron and Steel	$32.33	$32.38	$32.39	$32.54	$32.39	$31.38	$34.79
Finished Steel	54.00	54.00	54.00	54.00	54.00	51.10	54.88
Steelworks Scrap	10.46	10.71	11.04	11.66	11.02	12.30	14.52

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	March 23, 1935	Feb., 1935	Dec., 1934	Mar., 1934
Steel bars, Pittsburgh	1.80c	1.80c	1.80c	1.75c
Steel bars, Chicago	1.85	1.85	1.85	1.80
Steel bars, Philadelphia	2.09	2.09	2.09	2.04
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.60
Shapes, Pittsburgh	1.80	1.80	1.80	1.70
Shapes, Philadelphia	2.00½	2.00½	2.00½	1.90½
Shapes, Chicago	1.85	1.85	1.85	1.75
Tank plates, Pittsburgh	1.80	1.80	1.80	1.70
Tank plates, Philadelphia	1.98½	1.98½	1.98½	1.88½
Tank plates, Chicago	1.85	1.85	1.85	1.75
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.75
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.25
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	2.85
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.85
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.35
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	2.95
Plain wire, Pittsburgh	2.30	2.30	2.30	2.20
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.60	2.60	2.60	2.35

Semifinished Material

Sheet bars, open-hearth, Youngs.	$28.00	$28.00	$28.00	$26.00
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.00	26.00
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	26.00
Wire rods, Pittsburgh	38.00	38.00	38.00	36.00

Pig Iron

	March 23, 1935	Feb., 1935	Dec., 1934	Mar., 1934
Bessemer, del. Pittsburgh	$19.76	$19.76	$19.76	$19.26
Basic, Valley	18.00	18.00	18.00	17.00
Basic, eastern, del. eastern Pa.	19.76	19.76	19.76	18.76
No. 2, foundry, del. Pittsburgh	19.26	19.26	19.26	18.76
No. 2, foundry, Chicago	18.50	18.50	18.50	17.50
Southern No. 2, Birmingham	14.50	14.50	14.50	13.50
No. 2X eastern, del. Philadelphia	20.63	20.63	20.63	19.63
Malleable, Valley	18.50	18.50	18.50	17.50
Malleable, Chicago	18.50	18.50	18.50	17.50
Lake Superior charcoal, del. Chi.	24.04	24.04	24.04	23.54
Ferromanganese, del. Pittsburgh.	89.79	89.79	89.79	90.24
Gray forge, del. Pittsburgh	18.63	18.63	18.63	18.38

Scrap

Heavy melting steel, Pittsburgh	$12.00	$13.25	$12.95	$14.35
Heavy melt. steel, No. 2, east. Pa.	8.75	10.12	9.30	9.70
Heavy melting steel, Chicago	10.25	11.65	10.55	12.00
Rails for rolling, Chicago	11.25	12.55	11.65	12.75
Railroad steel specialties, Chicago	11.25	12.50	11.90	13.00

Coke

Connellsville, furnace, ovens	$3.60	$ 3.60	$3.60	$3.35
Connellsville, foundry, ovens	4.60	4.60	4.60	4.25
Chicago, by-product foundry, del.	9.25	9.25	9.25	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Prices are code levels filed with American Iron and Steel Institute, 350 Fifth avenue, New York. Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
New York, del.	2.18c
Philadelphia, del.	2.14c
Birmingham	2.00c
St. Louis, del.	2.17c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.60c
New York, del.	2.73c
Philadelphia, del.	2.69c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
Philadelphia, del.	3.39c
New York, del.	3.43c
Birmingham	3.25c
St. Louis, del.	3.42c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.07c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.79c
New York, del.	2.83c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.24c
New York, del.	3.28c

Enameling Sheets

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base con. (box) Pitts.	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold stp.	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
New York, del.	2.08c
Philadelphia, del.	1.98½c
Boston, delivered	2.20c
Buffalo, delivered	2.03½c
Chicago or Gary	1.85c
Cleveland, del.	1.98½c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.07c

Structural Shapes

Pittsburgh	1.80c
Philadelphia, del.	2.00½c
New York, del.	2.05½c
Boston, delivered	2.18½c
Bethlehem	1.90c
Chicago	1.85c
Cleveland, del.	1.98½c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel

Pittsburgh	1.80c
Chicago or Gary	1.85c
Duluth	1.95c
Birmingham	1.95c
Cleveland	1.85c
Buffalo	1.90c
Detroit, delivered	1.95c
Pacific ports, f.o.b. cars, dock	2.35c
Philadelphia, del.	2.09c
Boston, delivered	2.20c
New York, del.	2.13c
Pitts., forg. qual.	1.95c-2.05c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

Iron

Troy, N. Y.	1.70c
Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia	1.89c
Pittsburgh, refined	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.34c

Rail Steel

Straight lengths quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight or mixed carloads; pool cars, or less, 15c up. 10% dis. on nail extras on stright or mixed carloads to one consignee.)

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
do., 16 gage and finer	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs. and over	1.97½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	2.45c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo....0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni....1.05
5100 0.80-1.10 Cr....0.45
5100 Cr. spring....base
6100 bars....1.20
6100 spring....0.70
Cr., Ni., Van....1.50
Carbon Van....0.95
9250....Carbon base plus extras

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

Hot strip to 23⅛-in. Pittsburgh	1.85c
Chicago, base	1.95c
Birmingham base	2.00c
Detroit, delivered	2.05c
Phila., delivered	2.14c
New York, del.	2.18c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold-rolled strip, Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts. 24-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$20.00
80-85 lbs.	$24.00
100 lbs.	$25.00
Light Rails, billet qual. Pitts., Chi.	$35.00
Do., reroll. qual.	34.00
Angle bars, mills	2.55c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs. up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots, Dec. 1, 1932, lists, 10% extra for less full containers.

Carriage Bolts

All sizes, cut thread	70-10-5 off
Rolled thread, ½ x 6, smaller	70-10-5 off

Machine Bolts

All sizes cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts stud bolts	70-10-5 off
Tire bolts	60-5 off
Stove bolts, 75 off in pkgs.; 83 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Rolled thread machine, ½ x 6, smaller	70-10-5 off
Step bolts	70-5 off
Elevator bolts	70-5 off

Nuts

S.A.E. semifinished hex.; ½ to ⅞-inch	70-10-5 off
Do., ½ to 1-inch	70-10-5 off
Do., over 1-inch	70-5 off

Hexagon Cap Screws

Milled	85 off
Upset, 1-in., smaller	85 off

Square Head Set Screws

Upset, 1-in., smaller	70-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila., to jobbers & large nut, bolt mfrs.	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

Butt Weld

In.	Blk.	Gal.
Steel		
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55
Iron		
½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

Lap Weld

Steel		
2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½
Iron		
2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

Steel	
½, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$38.00-39.00
4-in., Birmingham	41.00-42.00
4-in., Chicago	49.00-50.00
6 to 24-in., Chicago	46.00-47.00
6-in. & over, east fdy.	42.00
Do., 4-in.	45.00

Class A pipe $3 over Class B.

Stnd. fitgs., Birm. base	$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$27.00
Philadelphia	32.30
Duluth	31.00
Forging, Pitts., Chi. and Buffalo	32.00
Forging, Duluth	36.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	28.00

Slabs

Pitts., Cleve., Young.	27.00

Wire Rods

(Common; combination up $2)

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point	1.70c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur	$3.60- 3.85
Connellsville, fdry.	4.60
Connel. prem. fdry.	5.10
New River fdry.	6.00
Wise county fdry.	4.45- 5.25
Wise county fur.	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	9.20- 9.65
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	11.00
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit ov., out. del.	8.50
Philadelphia, del.	9.00

Coke By-Products

Per gallon, producers' plants.

Tank lots	Spot
Pure and 90% benzol	15.00c
Toluol	30.00c
Solvent naphtha	26.00c
Commercial xylol	26.00c

Per lb. f.o.b. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls.	5.00c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Po.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del...	14.50	14.50	13.50	19.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Granite City, Ill.	18.50	18.50	18.00	.....
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
Delivered from Basing Points:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.02	.....	19.90	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.77	22.27	.....	.....
Brooklyn, N. Y., from Bmgham..	21.30	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham	19.13	.....	19.01	.....
Cleveland from Birmingham	18.62	.....	18.50	.....
Indianapolis from Hamilton, O...	20.77	20.77	20.27	21.27
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.50	19.50	19.00	20.00
Muskegon, Mich., from Chicago, Toledo or Detroit	21.40	21.40	20.90	21.90
Newark, N. J., from Birmingham	20.51	.....	.....	.....
Newark, N. J., from Bethlehem..	20.89	21.39	.....	.....
Philadelphia from Birmingham..	19.88	.....	19.76	.....
Philadelphia from Swedeland, Pa.	20.26	20.76	19.76	.....
Pittsburgh district from Neville Island	Neville base plus 63c, 76c and $1.13 switching charges			
Saginaw, Mich., from Detroit	20.60	20.60	20.10	21.10

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis from Granite City, Ill.	19.00	19.00	18.50	.....
St. Louis from Birmingham	18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

Low Phos

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $23.50. Phila. base, standard and copper bearing, $24.63.

Gray Forge		Charcoal	
Valley furnace	18.00	Lake Superior fur.	21.00
Pitts. dist. fur.	18.00	Do., del. Chicago	24.04

Silvery†

Jackson County, O., base; 6% $22.75; 7—$23.75; 8—$24.75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices, up $1.25.

Bessemer Ferrosilicon†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

First Quality.

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	45.00
Second Quality	
Pa., Ill., Ky., Md., Mo., Ga., Ala.	40.00
Ohio	
First quality	$40.00-45.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
Chemically bonded chrome brick	42.50
Magnesite brick	65.00
Chemically bonded magnesite brick	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide. net ton	$18.75-19.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$13.00-14.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base	85.00
Do., del. Pittsburgh	89.79
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	90.00
2% carbon, 95.00; 1%,	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply.

Nonferrous Prices

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Chinese Spot, N. Y.	Nickel Cathodes
Mar. 16	9.00	9.12½	7.60	47.15	46.85	3.55	3.40	3.90	*19.00	14.50	35.00
Mar. 18	9.00	9.12½	7.60	46.10	45.70	3.60	3.45	3.90	*19.00	14.50	35.00
Mar. 19	9.00	9.12½	7.60	45.75	45.40	3.60	3.45	3.90	*19.00	14.50	35.00
Mar. 20	9.00	9.12½	7.60	45.90	45.55	3.60	3.45	3.90	*19.00	14.50	35.00
Mar. 21	9.00	9.12½	7.60	45.70	45.37½	3.60	3.45	3.90	*19.00	14.50	35.00
Mar. 22	9.00	9.12½	7.60	45.85	45.50	3.60	3.45	3.90	*19.00	14.50	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 9.00c Conn. copper.

Sheets	
Yellow brass (high)	14.25
Copper, hot rolled	16.00
Lead, cut, to jobbers	7.25
Zinc, 100-lb. base	9.50
Tubes and Pipes	
High yellow brass	16.00
Seamless copper	16.25
Rods	
High yellow brass	12.75
Copper, hot rolled	13.25
Anodes	
Copper, untrimmed	13.75
Wire	
Yellow brass (high)	14.75

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
New York	4.25- 4.50
*Cleveland	5.00- 5.25
Chicago	4.37½-4.62½
St. Louis	4.75- 5.00
Heavy Copper and Wire	
New York	5.75- 6.00
Chicago, No. 1	5.37½-5.62½
*Cleveland	5.50- 5.75
St. Louis	5.25- 5.50
Composition Brass Borings	
New York	3.75- 4.00
Light Copper	
New York	4.50- 4.75
Chicago	4.12½-4.37½
*Cleveland	4.75- 5.00
St. Louis	4.75- 5.00
Light Brass	
Chicago	2.12½-2.37½
Cleveland	2.50- 2.75
Lead	
New York	2.70- 2.80
Cleveland	2.50- 2.75
Chicago	2.50- 2.75
St. Louis	2.65- 2.75
Zinc	
New York	1.87½-2.12½
Cleveland	2.00- 2.50
*St. Louis	2.40- 2.50
Aluminum	
Borings, Cleveland	7.25- 8.00
Mixed, cast, Clev.	11.50-12.00
Mixed, cast, St. L.	12.75-13.00
Clips, soft, Clev.	14.00-14.50

SECONDARY METALS

Brass ingot, 85-5-5-5	8.25
Stand. No. 12 Alum.	16.00-17.00

Iron and Steel Scrap Prices

Corrected to Friday night Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	9.00- 9.50
Boston, dock, expt.	8.50- 8.75
Boston, domestic	7.00- 7.25
Buffalo, No. 1	10.50-11.00
Buffalo, No. 2	9.25- 9.50
Chicago, No. 1	10.00-10.50
Cleveland, No. 1	9.75-10.25
Cleveland, No. 2	9.25- 9.75
Detroit, No. 1	8.00- 8.50
Detroit, No. 2	7.00- 7.50
Eastern Pa., No. 1	10.00-10.50
Eastern Pa., No. 2	8.50- 9.00
Federal, Ill.	7.50- 8.00
Granite City, R. R.	8.50- 9.00
Granite City, No. 2	7.00- 7.50
N. Y., deal. No. 2	7.50
N. Y., deal. barge	9.00
Pittsburgh, No. 1	11.75-12.25
Pittsburgh, No. 2	10.50-11.00
St. Louis	7.50- 8.25
Valleys, No. 1	12.50-12.75

COMPRESSED SHEETS

Buffalo, dealers	9.25- 9.50
Chicago, factory	9.50-10.00
Chicago, dealer	8.50- 9.00
Cleveland	9.75-10.25
Detroit	8.00- 8.50
E. Pa., new mat.	9.50-10.00
Pittsburgh	11.50-12.00
St. Louis	7.00- 7.25
Valleys	11.75-12.00

BUNDLED SHEETS

Buffalo	7.50- 8.00
Cincinnati, del.	6.00- 6.50
Cleveland	7.50- 8.00
Pittsburgh	10.25-10.75
St. Louis	4.50- 5.00

SHEET CLIPPINGS, LOOSE

Chicago	6.00- 6.50
Cincinnati	5.50- 6.00
Detroit	5.00- 5.50
St. Louis	4.00- 4.50

STEEL RAILS, SHORT

Birmingham	12.00-12.50
Buffalo	11.00-12.00
Chicago (3 ft.)	12.00-12.50
Chicago (2 ft.)	13.00-13.50
Cincinnati, del.	11.50-12.00
Detroit	11.00-11.50
Pitts., open-hearth, 3 ft. and less	14.00-14.50
St. Louis, 2 ft. & less	12.50-13.00

STEEL RAILS, SCRAP

Boston	7.00- 7.25
Chicago	10.00-10.50
Pittsburgh	12.25-12.75
St. Louis	9.50-10.00

STOVE PLATE

Birmingham	6.00- 6.50
Boston, dealers	3.75- 4.00
Buffalo	9.00- 9.50
Chicago, net	6.50- 7.00
Cincinnati, dealers	5.50- 6.00
Detroit, net	5.75- 6.25
Eastern Pa.	8.50- 9.00
N. Y., deal. fdry.	6.00
St. Louis	5.50- 6.00

COUPLERS, SPRINGS

Buffalo	12.75-13.25
Chicago, springs	11.50-12.00
Eastern Pa.	13.50-14.00
Pittsburgh	14.00-14.50
St. Louis	9.50-10.00

ANGLE BARS—STEEL

Chicago	11.50-12.00
St. Louis	10.00-10.50

RAILROAD SPECIALTIES

Chicago	11.00-11.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	12.75-13.25
Cleveland, billet, bloom crops	14.00-14.50
Eastern Pa., crops	13.00-14.00
Pittsburgh, billet, bloom crops	14.75-15.25
Pittsburgh, sheet bar crops	13.00-13.50
Pittsburgh, plate	13.00-13.50

FROGS, SWITCHES

Chicago	10.50-11.00
St. Louis, cut	10.00-10.50

SHOVELING STEEL

Chicago	10.00-10.50
Federal, Ill.	7.50- 8.00
Granite City, Ill.	7.00- 7.50

RAILROAD WROUGHT

Birmingham	7.50- 8.00
Boston, dealers	6.00- 6.50
Buffalo, No. 1	8.00- 8.50
Buffalo, No. 2	10.50-11.00
Chicago, No. 1, net	9.00- 9.50
Chicago, No. 2	10.00-10.50
Cincinnati, No. 2	8.00- 8.50
Eastern Pa.	10.50-11.00
N. Y., No. 1, deal.	7.50- 8.00
St. Louis, No. 1	6.50- 7.00
St. Louis, No. 2	8.00- 8.50

SPECIFICATION PIPE

Boston	3.00- 3.25
Eastern Pa.	9.50
New York, dealers	3.50- 4.00

BUSHELING

Buffalo, No. 1	9.25- 9.50
Chicago, No. 1	9.00- 9.50
Cinci., No. 1, deal.	6.00- 6.50
Cincinnati, No. 2	2.75- 3.25
Cleveland, No. 2	7.00- 7.50
Detroit, No. 1, new	7.00- 7.50
Valleys, new, No. 1	11.50-12.00

MACHINE TURNINGS

Birmingham	4.50- 5.00
Boston, dealers	1.00- 1.25
Buffalo	5.25- 5.75
Chicago	5.50- 6.00
Cincinnati, dealers	3.50- 4.00
Cleveland	6.50- 7.00
Detroit	4.00- 4.50
Eastern Pa.	6.00- 6.50
New York, dealers	2.00- 2.50
Pittsburgh	7.00- 7.50
St. Louis	3.00- 3.50
Valleys	8.00- 8.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	3.25- 3.50
Buffalo	6.00- 6.50
Cincinnati, dealers	4.50- 5.00
Cleveland	7.00- 7.50
Detroit	5.00- 5.50
Eastern Pa.	5.00
New York, dealers	1.50- 1.75
Pittsburgh	7.00- 8.00

CAST IRON BORINGS

Birmingham, plain	4.50- 5.00
Boston, chemical	5.50- 6.50
Boston, dealers	3.25- 3.50
Buffalo	6.00- 6.50
Chicago	5.50- 6.00
Cincinnati, dealers	3.50- 4.00
Cleveland	7.00- 7.50
Detroit	5.00- 5.50
E. Pa., chemical	11.00-12.00
New York, dealers	1.50- 1.75
St. Louis	3.50- 4.00

PIPE AND FLUES

Cincinnati, dealers	5.00- 5.50

RAILROAD GRATE BARS

Buffalo	7.00- 7.50
Chicago, net	6.00- 6.50
Cincinnati	4.00- 4.50
Eastern Pa.	8.50- 9.00
New York, dealers	4.00- 4.50
St. Louis	4.50- 5.00

FORGE FLASHINGS

Boston, dealers	4.50- 5.00
Buffalo	9.25- 9.50
Cleveland	8.00- 8.50
Detroit	7.00- 7.50
Pittsburgh	10.50-11.00

FORGE SCRAP

Boston, dealers	5.25- 5.50
Chicago, heavy	11.00-11.50
Eastern Pa.	10.00

ARCH BARS, TRANSOMS

St. Louis	10.50-11.00

AXLE TURNINGS

Boston, dealers	3.00- 3.50
Buffalo	7.50- 8.00
Chicago, elec. fur.	10.00-10.50
Cleveland	7.00- 7.50
Eastern Pa.	9.50
St. Louis	6.50- 7.00

STEEL CAR AXLES

Birmingham	12.50-13.00
Boston, ship. point.	10.00-10.50
Buffalo	12.75-13.25
Chicago, net	14.00-14.50
Eastern Pa.	16.50-17.00
St. Louis	12.50-13.00

SHAFTING

Boston, ship. point.	11.75-12.00
Eastern Pa.	16.50-17.00
New York, dealers	12.50-13.00
St. Louis	11.50-12.00

CAR WHEELS

Birmingham	9.00- 9.50
Boston, iron deal.	6.00- 6.50
Buffalo, iron	11.00-11.50
Buffalo, steel	12.50-13.00
Chicago, iron	11.00-11.50
Chicago, rolled steel	11.50-12.00
Cincinnati, iron	8.00- 8.50
Eastern Pa., iron	10.50-11.00
Eastern Pa., steel	13.50-14.00
Pittsburgh, iron	12.00-12.50
Pittsburgh, steel	14.00-14.50
St. Louis, iron	7.00- 7.50
St. Louis, steel	9.75-10.25

NO. 1 CAST SCRAP

Birmingham	9.50-10.00
Boston, No. 1 mach.	8.50- 9.00
Boston, No. 2	7.50
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	10.00-10.50
Buffalo, mach.	11.00-11.50
Chicago, agri. net	8.00- 8.50
Chicago, auto	9.00- 9.50
Chicago, mach. net	9.50-10.00
Chicago, railr'd net	8.50- 9.00
Cinci., mach. cup	8.50 9.00
Cleveland, cupola	11.50-12.00
Detroit, net	9.50-10.00
Eastern Pa., cupola	11.50-12.00
Pittsburgh, cupola	11.50-12.00
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	8.00- 8.50
St. L., No. 1 mach.	9.00- 9.50

HEAVY CAST

Boston, del.	5.25- 5.50
Buffalo, break.	8.00- 8.50
Cleveland, break.	8.50- 9.00
Detroit, auto net	10.50
Detroit, break.	7.00- 7.50
Detroit, auto net	9.50-10.00
Eastern Pa.	10.00-10.50
N. Y. break. deal.	5.75- 6.25
Pittsburgh	10.50-11.00

MALLEABLE

Boston, consum.	12.00-12.50
Buffalo	12.50-13.00
Chicago, R. R.	13.00-13.50
Cincinnati, agri. del.	8.25- 8.75
Cleveland, rail	12.00-12.50
Detroit, auto	11.00-11.50
St. Louis, R. R.	9.50-10.00
Eastern Pa., R. R.	11.00-11.50

RAILS FOR ROLLING

5 feet and over

Birmingham	11.00-11.50
Boston, dealers	8.00- 8.50
Buffalo	10.00-10.50
Chicago	11.00-11.50
Eastern Pa.	12.50-13.00
New York, dealer	7.50- 8.00
St. Louis	10.25-10.75

LOCOMOTIVE TIRES

Chicago (cut)	11.50-12.00
St. Louis, No. 1	10.00-10.50

LOW PHOS. PUNCHINGS

Buffalo	12.75-13.25
Chicago	12.50-13.00
Eastern Pa.	14.00
Pittsburgh	13.00-13.50

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbes.	4.65

Eastern Local Ores

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. & low phos.	9.50
Swedish basic, 65%	9.00
Swedish low phos.	9.50
Spanish No. Africa basic, 50 to 60%	9.00
Tungsten, spot, sh. ton unit, duty pd.	$17.75-18.25
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$18.00-19.50

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 52-55%	26.00
So. African, 52%	26.00
So. Afr., 49-51%	24.00
Indian, 58-50%	nominal
Indian, 48-50%	nominal

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	2.90c
Boston††	2.95c
Buffalo	3.00c
Chattanooga	3.31c
Chicago	2.95c
Cincinnati	3.15c
Cleveland	2.95c
Detroit	3.03½c
Houston	3.00c
Los Angeles	3.70c
Milwaukee	3.06c
New Orleans	3.30c
New York‡(d)	3.22c
Pittsburgh(h)	2.25-2.50c
Philadelphia*	2.90c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.19c
St. Paul	3.00c
Tulsa	3.25c
IRON BARS	
Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.00c
Chicago	2.75c
Cincinnati	3.15c
New York‡(d)	3.32c
Philadelphia*	2.90c
St. Louis	3.19c
Tulsa	3.25c
REINFORCING BARS	
Buffalo	2.60c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.15c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	3.50c
St. Louis	3.24c
Tulsa	3.25c
Young.	2.30c-2.60c
SHAPES	
Baltimore*	2.95c
Boston††	3.17c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland	3.31c
Detroit	3.40c
Houston	3.00c
Los Angeles	3.70c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.37c
Philadelphia*	2.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c
PLATES	
Baltimore*	2.95c
Boston††	3.18c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland, ¼-in. and over	3.31c
Detroit	3.40c
Detroit, 3/16-in.	3.65c
Houston	3.00c
Los Angeles	3.70c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.40c
Philadelphia*	2.95c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c
NO. 10 BLUE	
Baltimore*	3.05c
Boston††	3.25c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.20c
Cleveland	3.11c
Det., 8-10 ga.	3.13½c
Houston	3.35c
Los Angeles	3.80c
Milwaukee	3.16c
New Orleans	3.55c
New York	3.27c
Portland	3.75c
Philadelphia*	3.05c
Pittsburgh(h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.29c
St. Paul	3.45c
Tulsa	3.70c
NO. 24 BLACK	
Baltimore*†	3.51c
Boston (g)	3.90c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.85c
Cincinnati	4.05c
Cleveland	3.91c
Detroit	3.98½c
Los Angeles	4.45c
Milwaukee	3.96c
New York	3.85c
Philadelphia*†	3.55c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.09c
St. Paul	3.695c
Tulsa	4.75c
NO. 24 GALV. SHEETS	
Baltimore*†	4.21c
Buffalo	4.00c
Boston (g)	4.60c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.70c
Cleveland	4.61c
Detroit	4.70c
Houston	4.40c
Los Angeles	5.05c
Milwaukee	4.66c
New Orleans	4.95c
New York	4.50c
Philadelphia*†	4.25c
Pitts.** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.79c
St. Paul	4.19c
Tulsa	5.10c
BANDS	
Baltimore*	3.15c
Boston††	3.25c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.45c
Cleveland	3.36c
Detroit, ⅜-in. and lighter	3.38½c
Houston	3.25c
Los Angeles	3.90c
Milwaukee	3.41c
New Orleans	3.95c
New York(d)	3.62c
Philadelphia	3.15c
Pittsburgh(h)	3.20c
Portland	3.90c
San Francisco	4.05c
Seattle	3.90c
St. Louis	3.54c
St. Paul	3.20c
Tulsa	3.45c
HOOPS	
Baltimore	2.30c
Boston	4.25c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.45c
Det., No. 14 and lighter	3.38½c
Milwaukee	3.41c
New York	3.62c
Philadelphia	3.40c
Pittsburgh(h)	3.70c
Seattle	5.60c
St. Louis	3.54c
St. Paul	3.75c
COLD. FIN. STEEL	
Baltimore (c)	3.71c
Boston	3.85c-4.00c
Buffalo (h)	3.55c
Chattanooga*	4.06c
Chicago (h)	3.50c
Cincinnati	3.70c
Cleveland (h)	3.50c
Detroit	3.63½c
Los Ang.(f)(d)	4.95c
Milwaukee	3.61c
New Orleans	4.30c
New York	3.92c-4.42c
Philadelphia	3.73c
Pittsburgh(h)	3.45c
Portland (f)	4.75c
San Fran.(f)(d)	5.95c
Seattle(f) (d)	4.75c
St. Louis	3.74c
St. Paul	3.20c
Tulsa	4.65c
COLD ROLLED STRIP	
Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	3.39c
Chicago	3.27c
Cincinnati(b)	3.42c
Cleveland (b)	3.20c
Detroit	3.33c
New York	4.70c
St. Louis	3.36c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up)

	Base
High speed	57c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c

Uniform extras apply

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	70
Cleveland	70
Detroit	70
Milwaukee	70
Pittsburgh	70

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Minus quant. diff.; (e) New mill classif.; (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less.

‡Domestic bars; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs. extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, March 21

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	Continental Channel or North Sea ports, metric tons **Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$14.91 3 2 6	$13.86	1 13 0
Basic bessemer	13.12 2 15 0*	13.43	1 12 0
Hematite, Phos. .03-.05	14.91 3 2 6	.....	.....
SEMIFINISHED STEEL			
Billets	$26.24 5 10 0	$19.72	2 7 0
Wire rods, No. 5 gage	37.21 7 16 0	37.78	4 10 0
FINISHED STEEL			
Standard rails	$36.97 7 15 0	$46.17	5 10 0
Merchant bars	1.60c 7 10 0	1.19c to 1.24c	3 2 6 to 3 5 0
Structural shapes	1.57c 7 7 6	1.17c	3 1 6
Plates, †¼ in. or 5 mm.	1.70c 8 0 0	1.57c	4 2 6
Sheets, black, 24 gage or 0.5 mm.	1.97c 9 5 0	2.21c	5 16 0††
Sheets, gal., 24 gage, corr.	2.40c 11 5 0	2.46c	6 10 0
Bands and strips	1.81c 8 10 0	1.52c	4 0 0
Plain wire, base	1.97c 9 5 0	2.03c	5 7 6
Galvanized wire, base	2.40c 11 5 0	2.38c to 2.41c	6 5 6 to 6 7 6
Wire nails, base	2.56c 12 0 0	2.19c	5 15 0
Tin plate, box 108 lbs.	$ 4.29 0 18 2	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	L s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$16.10	3 7 6(a)	$17.16	260	$14.48	310	$25.34	63
Basic bessemer pig iron	16.10	3 7 6(a)*	12.21	185	13.30	280	27.96	(b)69.50
Furnace coke	3.94	0 16 6	7.92	120	5.14	110	7.64	19
Billets	26.24	5 10 0	28.38	430	20.55	440	38.82	96.50
Standard rails	1.76c	8 5 0	2.08c	694	2.31c	1,100	2.40c	132
Merchant bars	1.83c	8 12 0	1.68c	560	1.16c	550	2.00c	110
Structural shapes	1.86c	8 15 0	1.65c	550	1.16c	550	1.96c	107.50
Plates, †¼-in. or 5 mm.	1.93c	9 1 3	2.10c	700	1.47c	700	2.31c	127
Sheets, black	2.24c	10 10 0	2.55c	850‡	1.63c	775‡	2.62c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.77c	13 0 0	4.05c	1,350	3.15c	1,500	6.73c	370
Plain wire	1.97c	9 5 0	3.39c	1,130	2.31c	1,100	3.15c	173
Bands and strips	1.99c	9 7 0	1.95c	650	1.47c	700	2.31c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel a del. Middlesbrough. b hematite †† Close annealed

**Gold pound sterling carries a premium of 72.35 per cent over paper sterling.

Bars

Bar Prices, Page 56

Pittsburgh—Encouraging prospects in retail buying of small agricultural implements continue to prove a boon to the bar market, especially in view of continued relaxing by the automotive trade, explained by the heavy parts inventories which the automotive trade has ahead of it. Railroads continue inconsequential buyers of bars, although blanket second quarter requirements were being bid last week. The market is quoted at 1.80c, Pittsburgh, for hot-rolled bars, and 2.45c, Pittsburgh, for alloy bars.

Cleveland—Except for immediate requirements, new orders are being held off by consumers since two opposing reports on the steel basing point system were filed by the federal trade commission and NRA. Few definite contracts are expected covering the entire second quarter. Current specifications from automobile and other manufacturers are lighter.

Chicago—Steel bar sales and specifications are fairly steady, though off moderately from the quarter's peak. Consumers generally are more cautious in covering future needs, but consumption is being maintained in most instances. Farm implement manufacturers show no slackening in operations, one exception being the J. I. Case Co., whose Racine, Wis., plant is closed by a strike. Automotive needs, while still fairly heavy, show signs of tapering further.

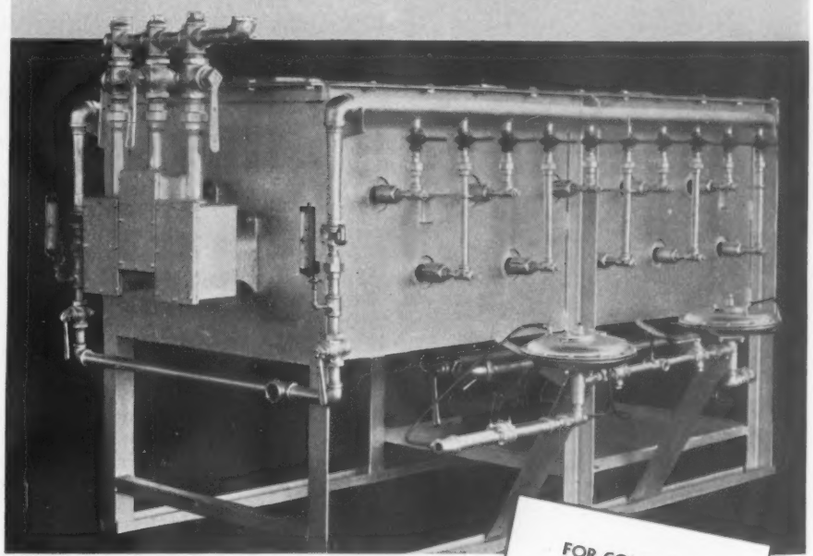
Boston—Commercial steel, forging and alloy bar demand is receding. Cold-drawn bars are more active than the other groups, but buying of these also has slackened. Industrial consumers are well stocked.

New York—Inquiry for steel bars is light. Bolt and nut manufacturers have been specifying lightly since early February and jobbers are slow to close. Some railroad inquiry is out, including one from the New York Central which will have a Clayton act opening March 29. Following increase from 1.80c to 2.05c on imported bars and light angles prices are again unsettled with increased offerings for resale here.

Washington—Bureau of supplies and accounts, navy department, Washington, will open bids March 26 on 46,000 pounds of flat medium black bar steel.

Philadelphia — Commercial steel bar demand has eased, with principal releases from cold drawers. However, the Pennsylvania, Norfolk & Western and Fruit Growers Express have recently closed bids for second quarter tonnage against which orders will soon be placed. The market is 1.80c, Pittsburgh, or 2.09c, Philadelphia.

ARMSTRONG INSULATION INSURES FUEL SAVINGS IN THIS "DX" GAS PREPARATION UNIT *built for the Societe Anonyme des Usines Renault*



HEATING costs are cut to a minimum with this Surface Combustion "DX" Gas Preparation Unit for a controlled atmosphere furnace, recently purchased by the manufacturer of Renault motor cars.

This furnace provides atmosphere for continuous gas carburizing certain automobile parts. Several of these units have been in service in this country providing gas for Surface Combustion continuous gas carburizing furnaces employed for carburizing camshafts, ring gears, plowshares, steering worms, and similar pieces of ware. The construction is 4½" fire brick, backed up by 4½" of Armstrong's Insulating Brick.

Armstrong's Insulating Brick prevent heating waste. And they do more! They insure quicker heating, a sharper furnace that can be keyed to the tempo of the other units in a continuous production line!

Armstrong's Insulating Brick are recommended for use up to 2500°F, behind the refractory. For temperatures up to 1600°F, Nonpareil Insulating Brick serve efficiently. Armstrong also offers EF Brick, a light-weight, insulating fire brick for use without fire brick protection up to 2475°F. We shall be glad to send you data and samples of these three brick.

FOR CONTINUOUS GAS CARBURIZING OF AUTOMOTIVE PARTS

SIDE VIEW of Surface Combustion "DX" Gas Preparation Unit recently purchased by the Societe Anonyme des Usines Renault, Seine, France. Advantages claimed for this unit include: Fuel savings, lower maintenance cost, more uniform heating. Armstrong's Insulating Brick help to control temperature and reduce fuel waste.

Just write Armstrong Cork Products Company, Insulation Division, 985 Concord Street, Lancaster, Pennsylvania.

Armstrong's

HIGH TEMPERATURE BRICK

Armstrong's • EF • *Nonpareil*

DOING THINGS TO PLANT MAINTENANCE COSTS

WITH THE SIMPLIFIED P & H-HANSEN ARC WELDER

Whether it's repair work or occasional production jobs around the shop, it's a matter of sound economy to own a P&H-Hansen Arc Welder. . . . Here's a welder that's built for years of tough service. The stable arc is "built in" . . . inherent . . . not obtained with external attachments. It's easier to operate, too, with simple current control over the entire welding range. Offered in all capacities from 50 to 800 Amps., portable, stationary or vertical models. Ask for Bulletin HW-3.

HARNISCHFEGER CORPORATION
4411 W. National Ave., Milwaukee, Wis.

P&H HANSEN ARC WELDERS

—The Market Week—

Plates

Plate Prices, Page 56

Pittsburgh — McClintic-Marshall Corp., Bethlehem, Pa., was low bidder last week at $58,900 for the construction of two steel dump scows requiring 345 tons of plates, for Grand Haven, Mich., delivery. Dubuque Boat & Boiler Works, Dubuque, Iowa, is low at $61,800 for a survey boat for the Omaha district. Titusville Boiler Works, Titusville, Pa., has been awarded contract for three boilers for the B. F. JONES, Ohio river towboat, owned by Jones & Laughlin Steel Corp., Pittsburgh, which is now being repaired. Plates are available at 1.80c, Pittsburgh.

Cleveland—Small lots from miscellaneous sources comprise a fairly substantial tonnage of plates placed here during the week. Railroads are buying conservatively for repair work and are issuing routine inquiries for unstated tonnages for second quarter. The Cleveland plate mill is operating at 45 per cent.

Chicago—Plate business continues light with requirements for public construction and miscellaneous uses outstanding. Demand from railroads and equipment builders shows no improvement and is lighter than a year ago when equipment improvement and building programs were getting under way. A fairly steady demand is in prospect for building work, including government dams.

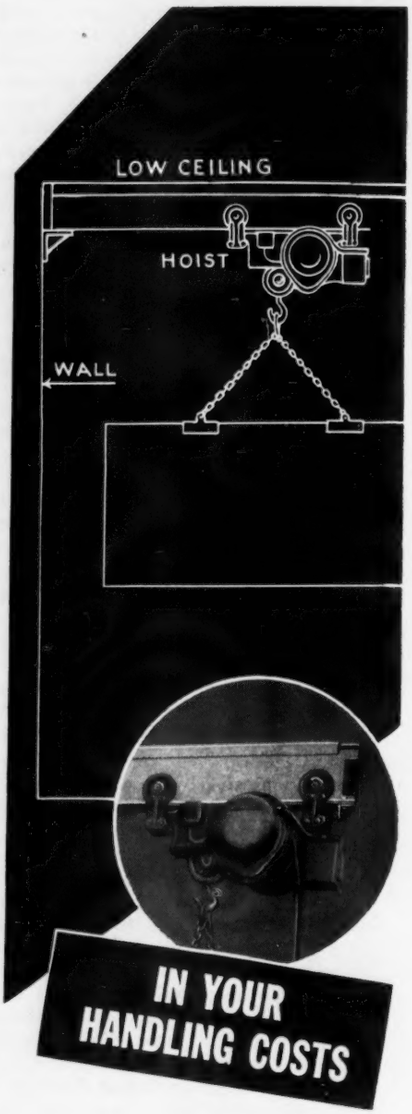
Boston—Absence of projects requiring tonnage fabrication continues to restrict plate demand to small miscellaneous lots covering a fairly broad field of requirements with hardly an outstanding outlet. Such orders are moderately numerous, but large shipments are few. Specialties, such as heads, and specified industrial needs are less active.

New York—Demand for steel plates is spotty. A substantial tonnage for two tankers for the Gulf Refining Co., New York, is up for bids March 28. About 1200 tons of fabricated steel pipe will be distributed by Alco Products Inc., New York. Bids will be opened April 8 on 100 tons for a standpipe for Greenwood Lake Village, N. Y.

Philadelphia—Plate buying continues to sag, although operations have been bolstered at some plants recently by release of navy tonnage. The only tank award noted recently is for 110 tons for a standpipe at Shoemakersville, Pa. The Spedden Shipbuilding Co., Baltimore, is reported low on a 50-foot all-steel tug for the United States engineer in Philadelphia, who is also in the market for a 65-foot tug, on which bids will be opened April 3.

Seattle—Development of private

DESIGNED TO SAVE YOUR DOLLARS



IN YOUR HANDLING COSTS

P&H hoist engineers can help you store your raw materials, and also speed up loading.

Note, for example, the manner in which they licked one storage problem where a manufacturer required low head room with a lift to within a few inches of the ceiling.

P&H engineers will carefully study your specific requirements before they recommend equipment. If they can't save you money, they'll frankly tell you so. Ask for catalog RH-2.

HARNISCHFEGER CORPORATION
4411 W. National Ave., Milwaukee, Wis.

P&H MILWAUKEE ELECTRIC HOISTS

projects in the Pacific Northwest is regarded as a favorable indication. Inquiry for plates is increasing. Steel digesters for the Weyerhaeuser Timber Co.'s pulp mill at Everett, Wash., awarded to Willamette Iron & Steel Works, Portland, Oreg., first reported as 500 tons, are said to require 1200 tons. Union Iron Works, Spokane, has the contract for four cement storage tanks for Spokane Portland Cement Co., each 90 feet high by 30 feet diameter, of concrete and plates.

San Francisco—Western Pipe & Steel Co. has taken 1300 tons of 54-inch welded steel pipe for the bay-crossing pipe line, Hetch Hetchy project, San Francisco. Consolidated Steel Corp. secured 125 tons of 18-inch welded pipe for Ventura, Calif. New inquiries include 245 tons of 60-inch pipe for the Crystal Springs tunnels, San Francisco water department, up for bids April 3.

Contracts Placed

1300 tons, 54-inch welded steel pipe, bay-crossing pipe line, Hetch Hetchy project, San Francisco, to Western Pipe & Steel Co., San Francisco.

125 tons, 18-inch welded steel pipe for Ventura, Calif., to Consolidated Steel Corp., Los Angeles.

110 tons, standpipe, Shoemakersville, Pa., to Chicago Bridge & Iron Works, Chicago.

100 tons, miscellaneous boiler contracts, to Commercial Boiler Works, Seattle.

Unstated, storage tanks, drums and equipment for Spokane Portland Cement Co., to Union Iron Works, Spokane.

Contracts Pending

406 tons, medium galvanized plates, supply officer, navy yard, Philadelphia.

345 tons, plates and shapes, two steel dump scows for delivery to Grand Haven Harbor, Mich.; McClintic-Marshall Corp., Bethlehem, Pa., low at $58,900 on bids to Milwaukee engineers.

300 tons, 1,500,000-gallon elevated tank, Aurora, Ill., bids March 20.

245 tons, 60-inch pipe for Crystal Spring tunnels, specification 74, San Francisco; bids April 3.

100 tons or more, single screw, steam-propelled lightship, commissioner of lighthouses, Washington; bids April 23.

Unstated tonnage, one 250-horsepower survey boat for the Omaha district; Dubuque Boiler Works, Dubuque, Iowa, low at $61,800, followed by Nashville Bridge Co., Nashville, Tenn., $80,993 and Marietta Mfg. Co., Point Pleasant, W. Va., $88,000.

Unstated, about 21,000 feet, 48 to 58-inch water pipe, for third unit Green river water system at Tacoma, Wash.; bids in April.

Unstated tonnage, 200,000-cubic foot gas holder, contract 307, department of public works, Baltimore, bids March 27.

Unstated tonnage, two 45-foot steel houseboats, bureau of biological survey, United States department of agriculture, Washington, bids March 26.

Unstated tonnage, 500,000-gallon elevated water tank, Campbellsport, Wis.; bids April 2.

Transportation

Track Material Prices, Page 57

Placing of a fourth articulated, streamlined, stainless steel train of four cars with the Edward G. Budd Mfg. Co., Philadelphia, by the Chicago, Burlington & Quincy indicates permanence of this class of equipment in the plans of this road. It will operate on a run of 221 miles from St. Louis to Burlington, Iowa.

Delaware river bridge commission, Philadelphia, has awarded 26 passenger cars for its high-speed bridge service to J. G. Brill Co., Philadelphia.

Second quarter requirements of steel by railroads are pending and bids are being asked by a number on moderate tonnages. San Francisco has placed 200 rolled steel car wheels for the municipal railroad with Edgewater Steel Co., Oakmont, Pa.

Relocation of tracks in the Muskingum conservancy district project in Ohio is expected to bring some

B&L Shafting

Turned and Ground
Turned and Polished
Drawn and Ground
Drawn and Polished

BETTER MADE STEELS LABORATORY TESTED

Write for the new SHAFTING Folder 4-S

THIS bucket loader derives its strength, durability and utility from the basic materials that go into it—and B&L Steel Shafting plays no small part in its construction, contributing to efficiency of operation, as well as to economy in manufacture.

Whatever type of mechanical equipment you build, there is satisfaction in knowing that, with B/L Shafting, you can secure the close tolerances in size, straightness and concentricity which are so necessary in fabricating your product and guaranteeing its performance.

Cold Finished Bars and Shafting
Free-Cutting Screw Stock
Extra Wide Flats
Special Sections
Alloy Steels

BLISS & LAUGHLIN, INC.
HARVEY, ILL. *Sales Offices in all Principal Cities* BUFFALO, N.Y.

steel rail business as railroads relocate tracks or build extensions. Wheeling & Lake Erie plans 27 miles of new right of way, the Baltimore & Ohio seven miles and the Pennsylvania a short distance.

Amtorg Trading Corp., New York, is inquiring for several switch engines for export to Russia.

Air conditioning work includes plans by Norfolk & Western for a number of cars at an expense of about $80,000. Pullman Standard Car Mfg. Co., Chicago, has taken orders from the Chesapeake & Ohio for air conditioning 14 coaches, from Seaboard Air Line for five and from New York, Chicago & St. Louis for one.

Central Railroad of Brazil has awarded a contract at £3,000,000 to Metropolitan-Vickers Ltd., England, for electrification work.

Buses Placed

Alabama Bus Co., Lexington, Ky., five highway coaches, to White Motor Co., Cleveland.

Carolina Coach Co., Raleigh, N. C., four city coaches, to White Motor Co., Cleveland.

Chicago Surface Lines, Chicago, eight city coaches, to White Motor Co., Cleveland.

New Orleans Public Service Co., New Orleans, seven Indiana city coaches, to White Motor Co., Cleveland.

North Shore Bus Co. Inc., Flushing, L. I., N. Y., 15 city coaches, to White Motor Co., Cleveland.

Southeastern Greyhound Lines of Tennessee, Lexington, Ky., five highway coaches, to White Motor Co., Cleveland.

Car Orders Placed

Chicago, Burlington & Quincy, one articulated, four-car, diesel-electric train to Edward G. Budd Mfg. Co., Philadelphia.

Delaware river joint commission, Philadelphia, 26 cars for Delaware river bridge, to J. G. Brill Co., Philadelphia, at $1,365,865, including station and signal equipment.

Rail Orders Placed

Gulf, Mobile & Northern, Mobile, Ala., 3218 tons rails,, 700 tons fastenings, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Locomotives Pending

Amtorg Trading Corp., New York, several switch engines for shipment to Russia; bids asked.

Rail Orders Pending

Maricopa county water district, Phoenix, Ariz., 1052 tons; bids asked.

"Can't We Use A Stamping Here?"

YOUR PRODUCT

Don't shake your head regretfully and answer "No" to this constantly recurring question until you get the last word from Parish designing service.

It is true, generally, that about a 100 lot is needed to make ordinary stampings economical; for difficult dies, 1000 or even 10,000 may be the minimum.

But a composite design of welding-and-stamping shows savings on a far smaller minimum than when dies alone are used.

This composite designing is a recent development; we often beat the bugaboo of high tool costs with it and save manufacturers a lot of money.

Why not send us YOUR blue prints and specifications?

PARISH PRESSED STEEL CO.

Specialists in difficult stamping design

Robeson & Weiser Sts. READING, PA.

Pacific Coast Rep.: F. Somers Peterson Co., 57 California St., San Francisco, Calif.

Wire

Wire Prices, Page 57

Pittsburgh—Buying of wire products in March is comparable with the same periods of January and February. Usually, March is a heavy month in merchant wire products, but jobbers and distributors continue their recent policy of failing to make heavy forward commitments. Inasmuch as automotive parts have been worked up sufficiently for assembly requirements over the next 60 days, automotive buying of manufacturing wire has lessened. The Pittsburgh base on manufacturing wire remains 2.30c; on spring wire, 2.90c, and on nails, $2.60 per keg.

Cleveland—New specifications from practically all consumers are slower, and the volume is down about 10 per cent compared with the preceding week. Mills, however, have backlogs to continue operating at 55 per cent for several weeks.

Chicago—Wire demand continues fairly steady, but the outlook is rather uncertain. Manufacturers' wire is moving at as good a rate as for the past several weeks, but consumers are cautious in ordering ahead and forward business is moderate. Buying from farm areas has increased somewhat recently, with further gains seen for the coming quarter.

Boston—Incoming wire volume is barely maintained and with some producers has declined. Little tonnage has been booked for second quarter and shipments are steady on first quarter volume which mills will be able to clear without difficulty.

Tin Plate

Tin Plate Prices, Page 56

Pittsburgh—If tin plate producers disregarded obsolete units, the average of operations in the industry now would be higher than 95 per cent. However, taking into consideration all plants, tin plate mills are at 85 per cent, an advance of over 5 points from a week ago. This is the highest rate for the middle of March in many years. Even at this advanced rate of activity, producers are able to add to their order backlogs. Canmakers' activities are calculated for even further increases over the coming spring months. The market continues based on $5.25, per base box, Pittsburgh, and 2.75c for No. 28 gage tin mill black sheets. The base on No. 24 unassorted long ternes is 3.40c, Pittsburgh.

New York—Tin plate specifications are strong, and an outstanding feature of steel demand in eastern markets.

Shapes

Structural Shape Prices, Page 56

New York—Award of 33,000 tons for the Triboro bridge, New York, last week, will be followed shortly by inquiry for an estimated 20,000 tons additional, material for the Harlem river and Bronx Kills spurs yet to be bid. Pending volume, with the closing of the Triboro tonnage, has dropped, although bridge requirements in New York and New Jersey are slightly heavier. Additional school contracts have been placed. Bookings in February were heavier than the previous two months, according to the American Institute of Steel Construction, 14 per cent above January and 10 per cent better than December.

Pittsburgh—The 10,300-ton mill building for the Great Lakes Steel Corp., Detroit, is about to be awarded, largely to Fort Pitt Bridge Works, Pittsburgh, but R. C. Mahon Co., Detroit, likely will receive a minor share. No definite awards on this project have as yet been made. Plain structural shapes are steady at 1.80c, base Pittsburgh, but prices on fabricated material are irregular.

Cleveland—In addition to 1325 tons of special shapes reported in STEEL, March 18, as placed with McClintic-Marshall Steel Corp., for a plate glass building in Detroit for the Ford Motor Co., a substantial tonnage of shapes will be required for the main structure. Structural shape awards generally are small and limited mainly to public works projects, including bridge repairs and postoffices.

Chicago—April 11 has been set for bids on the Alton, Ill., dam taking 6000 tons of plates and approximately 5000 tons of permanent and temporary piling. State bridges in Missouri, Oklahoma and Texas call for 1375 tons. The largest of awards is 1200 tons for a plate glass plant in Oklahoma.

Boston—Structural steel lettings are light, fresh inquiry being limited to a few hundred tons. Massachusetts is considering a large grade crossing program. Bids close April 9 on repairs to the army base piers, Boston, taking steel piling. New England freight association has docketed a proposal to cancel provisions covering fabrication in transit of steel from certain points on traffic destined to New York harbor lighterage points. Reason given is that present provisions are obsolete.

Philadelphia—Award of 480 tons for the north-side postoffice here features structural buying and leaves as outstanding a 400-ton bridge for the state of New Jersey, 275-ton addition for St. Mary's hospital here, and the 680-ton project for the North American Warhousing Co., this city, among pending projects. The 10,000-ton Library of Congress addition, Washington, has been postponed indefinitely. Prices are unchanged at 1.90c, Bethlehem, Pa., or 2.00½c, Philadelphia.

Buffalo—While no official announcement has been made it is understood 10,000 tons for Bethlehem Steel Co.'s sheet mill, Lackawanna, N. Y., will be fabricated in McClintic-Marshall Corp.'s plant, this city. After having operated

Shape Awards Compared

	Tons
Week ended March 23	54,120
Week ended March 16	10,179
Week ended March 9	9,242
This week in 1934	25,179
Weekly average, 1934	16,284
Weekly average, 1935	16,079
Weekly average, February	13,702
Total to date, 1934	231,746
Total to date, 1935	192,959

"A.W."
SUPER-DIAMOND
for Permanence and Economy
"Battle decks" for Bridges—the daily grind and pound of traffic can proceed promptly, safely and "permanently" over "AW" Super-Diamond Floor Plates.
More and more engineers are realizing the value of this floor plate on new construction (and the replacement of old decks) because it saves wear and tear—and taxes.
Also made in the reliable Standard Diamond and Diamondette patterns in ferrous or non-ferrous metals.
SLIP-PROOF • OIL-PROOF
HEAT-PROOF • CRACK-PROOF • SAFE • SIGHTLY
SELF-DRAINING
SPLINTERLESS
ALAN WOOD STEEL CO.
ESTABLISHED 1826
TRADE "A.W." MARK
CONSHOHOCKEN, PA.
109 Years' Iron and Steel Making Experience
ALAN WOOD
STEEL COMPANY
CONSHOHOCKEN, PA.
Branch Offices: Philadelphia • New York • Seattle
Los Angeles • San Francisco • Memphis • Boston

Bids on 33,000-Ton Bridge Itemized

Unit bids, steel in place, Triboro bridge suspended spans, viaduct approaches and miscellaneous requirements, New York, March 14

	12,000,000 lbs. carbon steel in suspended spans.	32,700,000 lbs. carbon steel in viaducts and anchorages.	7,900,000 lbs. silicon steel in suspended spans.	12,200,000 lbs. silicon steel in viaducts and anchorages.	620,000 lbs. cast steel.	19,200 lin. feet 3-in. steel railing in fascia girders.
	Unit bid	Unit bid	Unit bid	Unit bid	Unit bid	Unit bid
McClintic-Marshall Corp.	5.65c	3.85c	6.18c	4.37c	9.65c	83.00c
Harris Structural Steel Co.	5.70c	4.625c	6.20c	5.15c	8.00c	70.00c
American Bridge Co.	5.785c	4.64c	6.29c	5.21c	11.60c	85.00c
Taylor-Fichter Steel Constr. Co.	4.80c	4.60c	5.60c	5.50c	16.00c	$1.52
John A. Roebling's Sons Co.	6.40c	5.50c	6.80c	6.08c	11.00c	60.00c

	5400 lin. ft. railing on top chord of suspended spans.	500,000 lbs. wrought, cast, malleable iron, cast steel and carbon steel, drainage system.	9000 lbs. copper in drainage system.	Field painting of Queens and Ward's Island tower and anchorage cable bents.	
	Unit bid	Unit bid	Unit bid	Lump sum	TOTALS
McClintic-Marshall Corp.	$1.25	12.00c	40.00c	$10,000	$3,114,426
Harris Structural Steel Co.	70.00c	18.00c	50.00c	$22,200	$3,497,995
American Bridge Co.	$1.18	12.58c	41.75c	$12,425	$3,517,704
Taylor-Fichter Steel Constr. Co.	$2.80	38.00c	$1.50	$105,000	$3,645,604
John A. Roebling's Sons Co.	70.00c	10.00c	30.00c	$18,750	$4,000,410

CROSBY STAMPINGS

Since 1896 the Crosby plant has been devoted, exclusively, to designing and producing Sheet Metal Stampings. Avail yourself of this experience. Send us your next stamping problem and watch results.

Manufacturers IDEAL TROLLEY WHEELS

THE CROSBY COMPANY
BUFFALO, N. Y.

Branch Offices

New York, Philadelphia, Cleveland, Detroit, Chicago.

with only a skeleton force since late in 1934 the McClintic-Marshall plant has recalled more than 150 employes, and is about to start production of steel for the new mills. Sections will be rolled in the Lackawanna plant of Bethlehem.

San Francisco—More than 1500 tons were placed during the week. Columbia Steel Co. took 916 tons of sheet steel piling for state highway work in Ventura county, California. Ford Motor Co., for an exhibit building at the San Diego, Calif., fair, placed 300 tons of shapes with Pacific Coast Steel Corp., and 150 tons with Consolidated Steel Corp. It is understood the Maricopa county municipal water conservation district, Phoenix, Ariz., will shortly purchase 2452 tons. Few new inquiries of size developed during the week.

Seattle—Improved inquiry is noted from industrial sources. New projects have developed and considerable tonnage is pending. Wallace Bridge & Structural Steel Co., Seattle, booked 150 tons of piling for the Seattle seawall. Pacific Car & Foundry Co. Seattle, is low at $101,005 for fabricating two portable dams and derricks for the Bonneville, Oreg., project, involving 410 tons of nickel steel shapes and castings.

Shape Contracts Placed

33,000 tons, suspended spans, viaduct approaches, Triboro bridge, New York, to McClintic-Marshall Corp., Bethlehem, Pa., $3,114,426. Contract includes 22,350 tons, carbon structural steel; 10,050 tons, silicon structural steel; 310 tons, cast steel; 250 tons, wrought iron, gray iron, malleable, cast steel and carbon steel in drainage system; 19,200 linear feet, 3-inch steel railings; 5400 linear feet, steel railing on top chord and suspended spans and 9000 pounds, copper in place, drainage system.

10,000 tons, sheet mill building for Bethlehem Steel Co., Lackawanna, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa., material to be fabricated at Lackawanna and Buffalo plants of these companies.

4250 tons, 664 galvanized steel towers, including designing and fabrication, transmission line, Wilson-Norris dam, Tennessee valley authority, Knoxville, Tenn., to American Bridge Co., Pittsburgh, and Nashville Bridge Co., Nashville, Tenn.

1745 tons, service and emergency gates, Sheffield, Ala., for Tennessee valley authority; 1490 tons to Bartlett-Hayward Co., Baltimore; 190 tons to Ingalls Iron Works, Birmingham, Ala., and 65 tons to Virginia Bridge & Iron Co., Roanoke, Va.

1200 tons, plant, Pittsburgh Plate Glass Co., Henrietta, Okla., to McClintic-Marshall Corp., Bethlehem, Pa.

660 tons, bridge over Lafayette river for Norfolk, Va., to American Bridge Co., Pittsburgh.

575 tons, highway bridges, Oklahoma, to Capitol Steel & Iron Co., Oklahoma City, Okla.

510 tons, bridge, Washington avenue over Wallabout canal, Brooklyn, N. Y., to Phoenix Bridge Co., Phoenixville, Pa.; through Bersin Engineering Co.

480 tons, north side postoffice, Philadel-

phia, through George A. Fuller Co., Philadelphia, to the McClintic-Marshall Corp., Bethlehem, Pa.

450 tons, Ford Motor Co., exhibit building, San Diego, Calif., allocated as follows; to Pacific Coast Steel Corp., San Francisco, 300 tons, and to Consolidated Steel Corp., Los Angeles, 150 tons.

300 tons, New York Central railroad grade crossing elimination, Gary, Ind., to McClintic-Marshall Corp., Bethlehem, Pa.

220 tons, building, American Metal Products Co., Detroit, to R. C. Mahon Co., Detroit.

210 tons, alterations to Balch-Price store, Brooklyn, N. Y., to George A. Just Co., Long Island City, N. Y.; through William Kennedy Construction Co.

200 tons, bridge, Elmore, W. Va., for Virginia railroad to Virginia Bridge & Iron Co., Roanoke, Va.

165 tons, state bridge, Portland, Me., to McClintic-Marshall Corp., Bethlehem, Pa.

150 tons, bridge, Chippewa Falls, Wis., to Eau Claire Engineering Co., Eau Claire, Wis.

150 tons, master piling Seattle seawall, to Wallace Bridge & Structural Steel Co., Seattle.

150 tons, alterations to Tera House, East Third street, New York, to Alpha Iron Works, New York.

145 tons, Ford tower, San Diego, Calif., to Consolidated Steel Corp., Los Angeles.

130 tons, repairs to Harvard-Denison bridge, Cleveland, to Republic Structural Iron Works, Cleveland.

100 tons, postoffice, Huntington Park, Calif., to Pacific Coast Steel Corp., San Francisco.

100 tons, tunnel forms, metropolitan water district, Los Angeles, specification 89, to Pacific Iron & Steel Co., Los Angeles.

100 tons, addition to plant of American Manganese Steel Co., Oakland, Calif., to Pacific Coast Steel Corp., San Francisco.

100 tons, building, National Lead Co., Brooklyn, N. Y., to Richie & Penner, Brooklyn; through William Kennedy Construction Co.

Shape Contracts Pending

6000 tons, Mississippi river dam, Alton, Ill., also 2743 tons of permanent piling and 2000 to 3000 tons of temporary piling; bids to United States engineer, Rock Island, Ill., April 11.

2500 tons, postoffice and court house, San Antonio, Tex.

2452 tons, Maricopa county municipal water conservation district, Phoenix, Ariz.; general contract to Pleasant-Hassler Construction Co., Phoenix, Ariz., for placing. District will award material soon. Includes 1052 tons of rails and 160 tons of taintor gates.

1350 tons, public school No. 43, New York; George A. Driscoll Co., Brooklyn, N. Y., low.

575 tons, ten state highway bridges, Missouri.

500 tons, four state highway bridges, Oklahoma.

500 tons, New York Central railroad grade crossing elimination work, Utica, N. Y.; bids in.

500 tons, state highway bridge, Green county, New York.

440 tons, state highway bridge, Lexington, Va.

427 tons, state bridge, Mantua creek, route 44, near Paulsboro, Gloucester county, New Jersey; bids April 1, state highway commission, A. Lee Grover, chief clerk. Project also takes 51 tons of reinforcing steel, 47 tons of machinery and 4585 square feet of steel grid flooring.

410 tons, including nickel castings, portable dams and derricks, Bonneville, Oreg., dam project; Pacific Car & Foundry Co., Seattle, low.

400 tons, state bridge, Gloucester county, New Jersey; bids March 29.

350 tons, science building, St. Peter's college, Jersey City, N. J.

300 tons, high school, St. Louis.

275 tons, nurses' home, St. Mary's hospital, Philadelphia; B. J. McKenna, Philadelphia, low on general contract.

215 tons, grade elimination, Fort Wadsworth, Staten Island, N. Y.; bids April 8.

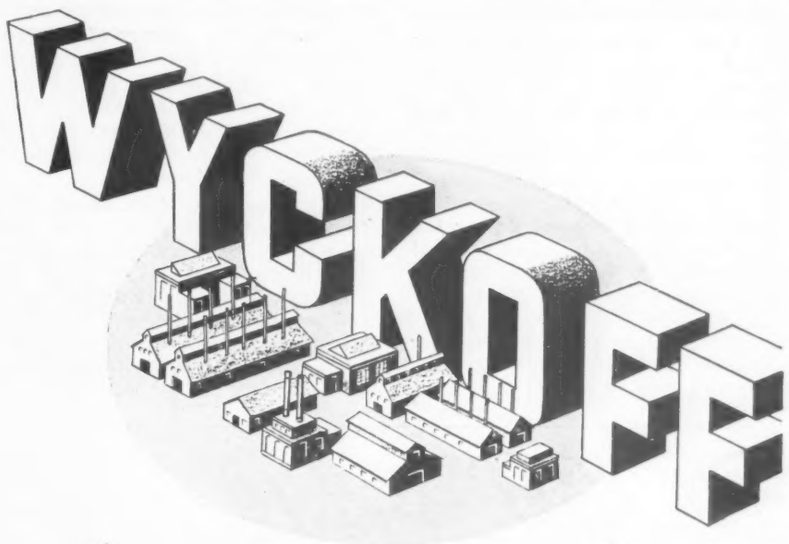
190 tons, bus garage, Lowell, Mass.

138 tons, railroad grade elimination, routes 23 and 6, Singac, Passaic county, New Jersey; bids April 8, state highway commission, Trenton, A. Lee Grover, chief clerk.

135 tons, state bridge Ellensburg, Wash.; bids April 2.

100 tons, brew house, German Brewery Co., Cumberland, Md.; additional to duplicate building recently awarded Fort Pitt Bridge Works, Pittsburgh.

Unstated tonnage, plate glass building for Ford Motor Co., Detroit; in addition to the 1325 tons of special shapes for the foundation reported in STEEL, March 18, as placed with McClintic-Marshall Corp., Bethlehem, Pa. Albert Kahn, Detroit, architect.



Industry's metallurgical guide

Laboratory standards prevail at every step in the production of **WYCKOFF STEELS** from the testing, selection and inspection of raw steel to the smooth polished finish, shape and dimension you require in your manufacturing processes. A good reason why you should make **WYCKOFF** your headquarters for Cold Drawn Steels, Turned and Polished Shafting, Turned and Ground Shafting.

WYCKOFF DRAWN STEEL COMPANY

GENERAL OFFICES: First National Bank Bldg., Pittsburgh, Pa.

MILLS at Ambridge, Pa. and Chicago, Ill.

Reinforcing

Reinforcing Bar Prices, Page 57

New York—With awards exceeding 1000 tons for the second consecutive week, pending tonnage is sharply reduced. Most of the larger projects have been placed and new inquiry fails to match recent buying. New Jersey has highway and bridge contracts closing April 1 taking 325 tons.

Pittsburgh—Plans of McKeesport, Pa., city officials for a $2,000,000 grade crossing project may soon take effect if federal funds are obtained. The 2.05c, Pittsburgh, market for carload cut lengths of new billet bars is steady.

Cleveland—Both for public and private work, buyers are slow to close. Weeks elapse between the time inquiries for steel are issued and orders are placed. Outstanding among inquiries received during the week was 700 tons for the Cleveland housing project, bids for which will be taken in Washington April 23.

Chicago—While some delay still prevails in closing on pending bar tonnages, the outlook for increased production during second quarter is favorable in view of the amount of prospective work. The largest of local awards is 475 tons for a department store. Bids close April 11 on the Alton, Ill., dam, involving 2500 tons.

Boston—Several hundred tons placed and pending in Connecticut features activity in reinforcing bars. Included in the buying was close to 100 tons of highway mesh for that state. Postponement of bids on the Mount Pleasant avenue school, Providence, R. I., holds up about 500 tons of bars.

Philadelphia—Award of 650 tons for the local naval aircraft factory is the largest in this district in recent weeks. The Library of Congress addition, Washington, has been postponed indefinitely, which withdraws from the market approximately 370 tons of bars. Billet steel bars, cut lengths, are 2.05c, Pittsburgh, or 2.34c, Philadelphia.

San Francisco—Awards of reinforcing bars aggregated over 2300 tons but were comprised of projects requiring 200 tons or less. The Maricopa county municipal water conservation district, Phoenix, Ariz., will purchase 485 tons shortly. Bids have been taken on 418 tons for highway work in California, and on 400 tons for the Hall of Records, Fresno, Calif. Pending business now exceeds 18,000 tons.

Seattle—Considerable new work is developing and improved demand is anticipated in the near future. The week's awards were not impressive but substantial tonnages are pending. Seattle has opened bids for 150 tons for a seawall sidewalk and handrail.

Reinforcing Steel Awards

650 tons, sewage treatment plant, Coney Island, Brooklyn, N. Y., to Kalman Steel Corp., Bethlehem, Pa.; North-Eastern Construction Co., New York, general contractor.

650 tons, naval aircraft plant, Philadelphia, through Irwin & Leighton, general contractors, Philadelphia, to Concrete Steel Co., New York.

475 tons, store, Goldblatt Bros. Inc., Chicago, to Inland Steel Co., Chicago.

262 tons, high school, Bayonne, N. J., to Truscon Steel Co., Youngstown, O.

150 tons, pier 45, department of docks, New York, to Truscon Steel Co., Youngstown, O.; Cauldwell-Wingate Co., New York, general contractor.

150 tons, postoffice, Phoenix, Ariz., to unnamed interest.

135 tons, college building, Hartford, Conn., to Truscon Steel Co., Youngstown, O.; W. E. O'Neill Co., general contractor.

119 tons, seven state bridges, Yuba county, California, to unnamed interest.

100 tons, county hospital, Madera, Calif., to unnamed interest.

100 tons or more, Great Western Malting Co. plant, Vancouver, Wash.; Dougan & Hammond, Portland, general contractors.

100 tons, Century Brewing Co. addition, grange building and miscellaneous, to Northwest Steel Rolling Mills and Pacific Steel Corp., Seattle.

Unstated tonnage, 1,500,000 square feet, galvanized welded fabric, United States engineer, New Orleans, to Kalman Steel Corp., Bethlehem, Pa.; bids March 2, schedule 409.

Reinforcing Steel Pending

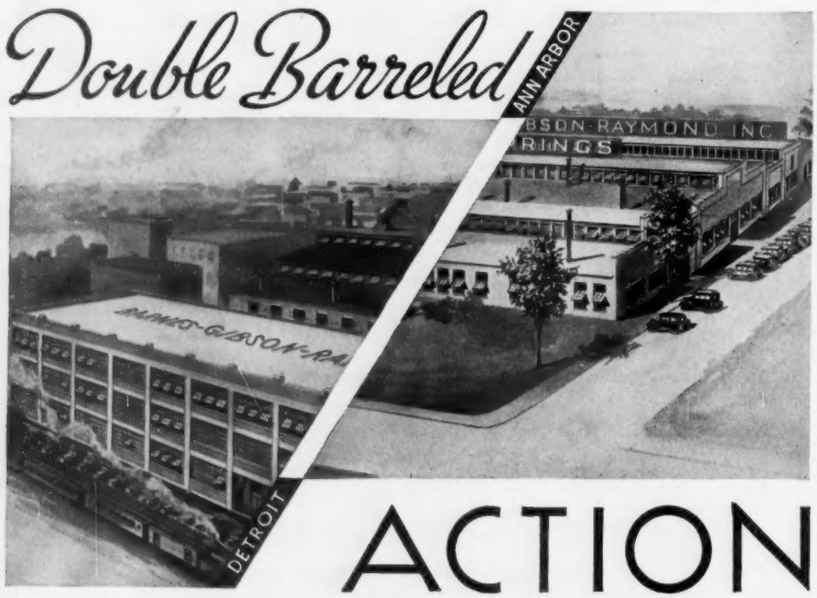
2500 tons, Mississippi river dam, Alton, Ill.; bids to United States engineer, Rock Island, Ill., April 11.

950 tons, bars and shapes, school, Mount Pleasant avenue, Providence, R. I.; bids due March 13, postponed.

700 tons, Cleveland housing project; bids in Washington, April 23.

600 tons, intercepting sewer section, 7148 feet, 78-inch, metropolitan district of Hartford county, Hartford, Conn.; bids in March 22.

475 tons, state bridges, Texas.



Double Barreled ACTION

When the target is a matter of quantity spring production, we can aim both our plants—pull the trigger—and deliver springs with machine-gun-like rapidity. For more normal spring requirements we can aim and fire either barrel at Detroit or Ann Arbor. We have devoted many years to the research and manufacture of springs—and if you wish a sample of our marksmanship, just supply us with the target—your inquiry for springs—wire forms and small stamped-metal parts.

BARNES • GIBSON • RAYMOND • INC

DETROIT DIVISION 6400 MILLER AVENUE | 2 PLANTS FOR SPRING SERVICE | COOK SPRING CO. DIVISION ANN ARBOR, MICHIGAN

Concrete Awards Compared

	Tons
Week ended March 23	2,891
Week ended March 16	6,245
Week ended March 9	1,726
This week in 1934	4,391
Weekly average, 1934	4,084
Weekly average, 1935	4,914
Weekly average, February	5,506
Total to date, 1934	53,339
Total to date, 1935	58,974

450 tons, road work, Illinois; bids taken at Springfield, March 22.
370 tons, Library of Congress addition, Washington, project postponed indefinitely.
280 tons, state highways, route 21, section 3, Newark, N. J., and route S-24, section 2, Union county, New Jersey; bids April 1, state highway commission, A. Lee Grover, Trenton, chief clerk.
150 tons, Seattle seawall project; bids in.
135 tons, outfall sewer, Hartford, Conn.; D. E. Savin Co., Hartford, general contractor.
128 tons, Port Angeles, Wash., bridge project; bids in.
100 tons, state bridges, Killingworth and Madison, Conn.; D. V. Frione & Co., New Haven, Conn., general contractor.
100 tons, bridges, La Crosse county, Wisconsin; bids April 2.

Sheets

Sheet Prices, Page 56

Pittsburgh—For the second consecutive week, new specifications for sheets have declined, and orders from other than the automotive trade are more infrequent. Nonetheless, cold-reduced sheet deliveries cannot be made much before seven to eight weeks, and a leading interest cannot promise deliveries until eight to nine weeks. Barring holdups and cancellations, it will not be long before the entire second quarter will be sold out in cold-rolled sheets. In the hot-rolled grades, deliveries can be promised sooner, except for processing. The base price on cold-rolled sheets is steady at 2.50c for No. 10 gage and 2.95c, Pittsburgh, for No. 20 gage. Galvanized sheets are 3.10c, Pittsburgh; black sheets, 2.40c; and hot-rolled No. 10, 1.85c.

Cleveland—The market is quieter, although sheet mills here and in an adjacent lake district have backlogs to sustain operations near capacity for about four weeks. Specifications from automobile manufacturers have declined, but sheet producers believe this is only a temporary development, as neither consumption, nor schedules for car production have been revised downward. Miscellaneous buying is fairly steady.

Chicago—While sheet buyers generally defer placing of forward requirements, activity in the market is well maintained and is at a materially better rate than is indicated by the general tone of sentiment. Mills still are busy in completing shipments of cold-rolled sheets against old orders, particularly to the automotive industry, while no marked slackening is evident in requirements of other major sheet consumers.

Boston—Sheet buying is slower, practically all finishes being less active. Cold finished, which has led demand for some time, has dropped less than other grades of sheets.

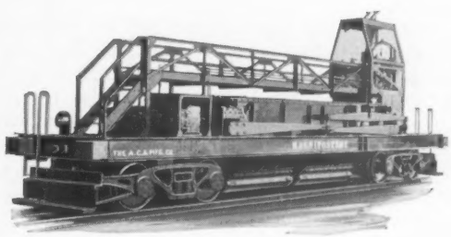
New York—While less pressing than earlier in the month sheet demand is holding up fairly well. However, lack of important building and slowing in specifications from refrigerator and washing machine manufacturers are noted. A tonnage may be purchased for air conditioning the United States treasury, Washington, by Raisler Heating Co., New York, low for the contract with a bid of over $300,000.

Philadelphia—Sheet buying generally is less active than a month ago. Consumers show far less concern over the question of deliveries and, with few notable exceptions, are specifying only for definite requirements.

Buffalo—Buffalo sheet mills are operating at 75 per cent and will continue at this rate through the next 30 days.

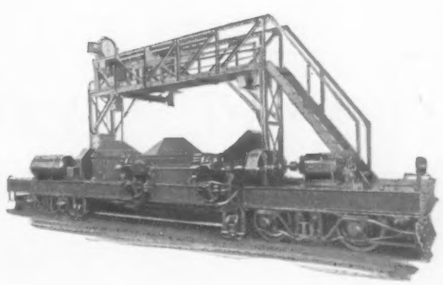
Cincinnati—Production and shipments of sheets during March will exceed other months of the quarter. Schedules may be reduced in April, but new buying has been in fair volume, with demand from manufacturers of household appliances and

ATLAS SCALE CARS



20 Ton — Double Compartment Scale Car. Journals provided with self aligning anti-friction bearings. Equipped with Atlas Indicator and Recorder.

20 Ton Two Compartment Scale Car with Orr Bin Gate Operating Mechanism. Anti-friction bearings. Equipped with Atlas Indicating and Recording Mechanism.



Other Atlas Products

Gas-Electric and Diesel-Electric Locomotives—Car Pushers—Storage Battery Locomotives—Electrically Operated Industrial Cars—Scale Cars and Weighing Cars of all kinds — Ore Transfer Cars and Blast Furnace Charging Cars.

Coke Oven Equipment

Pushers and Levelers—Coal Charging Cars—Door Handling Machines — Coke Quenching Cars.

Also Atlas Patented Indicating and Recording Mechanism for Weighing Scales.

THE ATLAS CAR & MFG. CO.

Engineers *Manufacturers*

CLEVELAND, OHIO

miscellaneous sources fairly steady.

St. Louis—The lighter gages of sheets continue in active demand, but no signs of improvement have developed in the heavier materials. Orders are mainly small individually and bear prompt shipment specifications.

Seattle—Activity in construction of service stations and extensive industrial repair operations have stimulated demand for sheets, which also are moving freely to public works projects. The Alaska road commission has opened bids at Seattle for 12,256 feet of corrugated pipe fabricated from galvanized sheets.

Pipe

Pipe Prices, Page 57

Pittsburgh—The legality of a previously-mentioned PWA financed gas pipeline from the Texas Panhandle to St. Louis and Detroit is being studied. Recent developments involved the suggestion last week that the Texas Gas Conservation Corp. be created as sponsor and bonds to a maximum of $60,000,000 be issued. R. B. Anderson, Texas tax commissioner, may go to Detroit shortly to discuss plans with officials there.

Chicago—This city shortly is expected to place 2100 tons of 6, 8, 12 and 16-inch pipe on which bids were taken a week ago, low bidders being the United States Pipe & Foundry Co. and Lynchburg Foundry Co. Occasional releases are being received against old orders, though pipe laying activity generally is restricted in northern states.

Boston—Wareham, Mass., has bids on close to 1200 tons of cast pipe, but inquiry in the New England district has been slow to materialize, although a considerable number of water main extensions and some replacements are being planned.

New York—Cast pipe buying is light with inquiries slightly more numerous. Bids are expected soon on close to 600 tons for Montclair, Paterson and Hackensack, N. J., while Mamaroneck, N. Y., has bids on 325 tons, 30-inch and under. Several hundred tons recently bid for Torrington, Conn., went steel pipe. Part of the several thousand tons for New York city has been placed tentatively, subject to final approval of the general contractor.

Philadelphia—While far from brisk, demand for merchant pipe the past few days has shown some improvement, reflecting seasonal gain in miscellaneous construction. Tubular goods for oil companies are moving at a good rate, although new orders are in smaller volume than a month ago.

Buffalo—Following action by the state legislature setting up a sewage disposal authority, this city has been instructed to proceed immediately with detailed plans for a $15,000,000 program of public works which will take considerable pipe.

San Francisco—After several rather active weeks, demand for cast iron pipe has fallen off. Award of over 5000 tons for the Hetch Hetchy bay-crossing pipeline here is expected to be made within a few days.

Seattle — The market continues quiet, no important projects having developed. Present business is mostly small lots out of stock.

Birmingham, Ala.—Orders continue small. With one exception, pipe makers' stocks of pig iron are light and the present production, around 35 per cent, will be held, it is indicated.

Cast Pipe Placed

194 tons, 6 to 12-inch, class 150, Beverley Hills, Calif., to Franklin B. Gridley, Pasadena, Calif., general contractor.

111 tons, 6 and 8-inch, class 150, Beverley Hills, Calif., to unnamed interest.

Unstated tonnage, 4500 feet of 8-inch, new waterworks, Stratford, Wis., to Central Foundry Co., Chicago.

Cast Pipe Pending

2100 tons, 6 to 16-inch, Chicago; United States Pipe & Foundry Co., Burlington, N. J., low on 1500 tons of 12 and 16-inch, Lynchburg Foundry Co., Lynchburg, Va., low on 600 tons of 6 and 8-inch.

1790 tons, 16 and 12-inch, Nashville, Tenn.; bids April 2.

1200 tons, 6 to 10-inch, Wareham, Mass.; bids in.

900 tons, 10-inch and under, Greenwood Lake, N. Y.; bids April 18.

457 tons, 4 to 8-inch, class 150, Mountain Home, Idaho; bids soon.

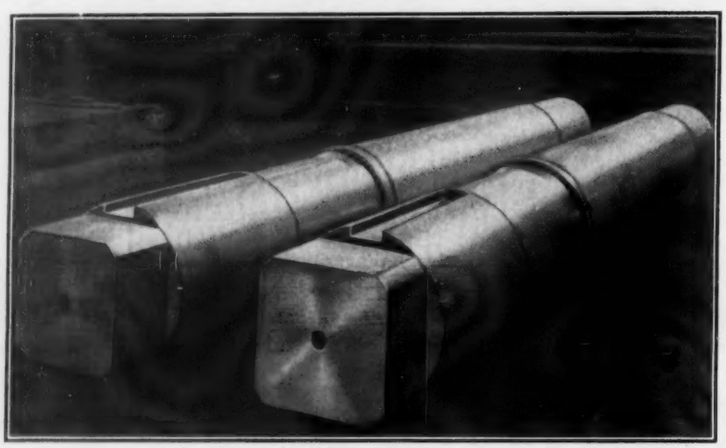
325 tons, 30-inch and under, Mamaroneck, N. Y.; bids in.

200 tons, 8-inch, new waterworks, Campbellsport, Wis.; bids April 2.

150 tons, 12-inch, Danbury, Conn.

150 tons, department of interior, division of subsistence homesteads, delivery Daily, W. Va.; United States Pipe & Foundry Co., Burlington, N. J., low.

QUALITY FORGINGS



17,000 lb. Sugar Mill Shaft

Rolled Steel Wheels — Rolled Steel Rings and Flanges
Forgings — Steel Castings — Steel Tires
Springs — Gear Blanks

STANDARD STEEL WORKS COMPANY
BURNHAM, MIFFLIN CO., PENNA.

Branch Offices
New York Philadelphia Chicago San Francisco
Akron Portland, O. St. Louis

Strip Steel

Strip Prices, Page 57

Pittsburgh—Owing to lower schedules by one leading interest, hot-rolled strip operations for the industry underwent a decline to about 50 per cent of capacity last week. Cold-rolled strip steel activities are fairly steady on the basis of 65 per cent of present capacity. There continue to be a numerous miscellaneous strip

steel orders in the market and automobile buying for late April and May shipment is still at a high level. The market is quoted 1.85c, Pittsburgh, for hot-strip, and 2.60c, Pittsburgh or Cleveland, base on cold-strip.

Cleveland—While shipments are sustained, producers are not receiving specifications from automobile manufacturers in the volume noted in February. Mills have good backlogs for several weeks. Few orders are being received from other than automotive sources.

Chicago—Strip consumers are inclined to purchase material as needed except for products in which delay in shipments is likely to develop. Shipments recently have been fairly steady and there is little evidence of marked decline in consumption among principal industries. Second quarter buying is proceeding slowly.

Boston—Most cold-rolled strip producers have limited backlogs and with new business lagging behind shipments, operations are beginning to decline. There are a few exceptions, but practically all mills will clean up first quarter shipments without pressure and unless an unexpected upturn develops before April 1, producers will enter second quarter with small tonnage on books. Cold strip is steady at 2.80c, Worcester, Mass., base.

Philadelphia—Narrow strip tonnage is moving slowly, with little change in recent weeks. If anything, current demand is more quiet. Prices are unchanged at 1.85c, Pittsburgh, or 2.14c, Philadelphia, for hot strip, and 2.60c, Pittsburgh, or 2.89c, for cold strip.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 57

The advanced market of 70-10-5 off list on bolts and nuts has not been afforded conclusive test although it is reported the higher price has been paid on a spot basis. Large rivets hold at 2.90c, Pittsburgh and Cleveland, 3.00c, Chicago, and small rivets at 70-5 off list.

Cold Finished

Cold Finished Prices, Page 57

Pittsburgh—Reflecting stocks of semifinished automotive parts sufficient for 45 to 60 days cold-finished steel bar buying last week experienced some severe contraction, both in number and size or orders. Many miscellaneous buyers of cold-finished bars also show a bought-up condition for the time being. Carbon cold-drawn bars at 2.10c, Pittsburgh, and alloy grades at 2.95c, base Pittsburgh, are steady.

Pig Iron

Pig Iron Prices, Page 58

Pittsburgh—Davison Coke & Iron Co.'s Neville Island, Pa., merchant pig iron furnace, out since early December of 1934, is expected to resume blast shortly. The furnace had been down for a complete relining. Pig iron shipments so far in March are ahead of the February rate, but individual requirements are light. Local steel mill equipment builders are active melters but reciprocity arrangements dominate their pig iron requirements. Foundry iron remains available at $18.50, Pittsburgh district furnace, basic is unchanged at $18 per ton and bessemer holds at $19.

Chicago—Activity in pig iron still indicates a rising trend in foundry operations. Shipments against old contracts hold at a better rate than in February, while orders for second quarter delivery are improving steadily. Farm implement foundries expect better operations during second quarter. A strike at the Racine, Wis., plant of the J. I. Case Co. has caused a shutdown there, but works of other companies are operating at schedules equal to, or better than, those of a month ago. Pig iron continues $18.50, furnace, for No. 2 foundry and malleable.

Cleveland — Sales during the week were a little more active, a lake furnace interest booking slightly more than 10,000 tons, double the tonnage in the preceding week. Automotive foundries still are the most active in the market. Jobbing foundries are buying little material. Shipments continue with a good lead over the February average.

National Tube Co., Lorain, O., is blowing out one blast furnace.

Boston—In small lots, pig iron sales are chiefly to smaller consumers operating with light stocks. Larger melters generally are covered through the next quarter. Domestic prices are steady at the code quotations, but buyers of one foreign brand are paying slightly under the code level.

New York—Pig iron business continues at low ebb, with buyers covering only on immediate requirements. Even the threat of serious labor troubles in the bituminous coal regions in April fails to arouse interest in future requirements of pig iron. A price of $14.50 was filed last week on malleable iron at Birmingham, Ala. This

CARNEGIE ABRASION RESISTING STEEL AGAIN PROVES ITS SUPERIOR QUALITIES

On a recent dredging operation on the Columbia River, two kinds of dredge pipe were used. The engineer reports that:

After handling 3,000,000 cu. yds. of sand and gravel, the mild steel dredge pipe was worn through. The pipe made from Carnegie Abrasion Resisting Steel had merely been well polished.

This is a typical report from a user of Carnegie Abrasion Resisting Steel. In a wide variety of applications, results are consistently successful. *Your inquiries are solicited.* 323

CARNEGIE STEEL COMPANY • PITTSBURGH

United States Steel Corporation Subsidiary

is the same as that put into effect earlier in the year and later withdrawn.

Philadelphia—Pig iron shipments are confined largely to small scattered lots for immediate requirements. Consumers generally are specifying more conservatively than a fortnight ago. A blast furnace in this district, however, is expected to blow in shortly, and plans for lighting another eastern furnace within the next month are reported active. Bureau of supplies and accounts, navy department, takes bids March 26 on 250 tons of low-phosphorus foundry iron.

Buffalo—While March shipments of iron have not held up to averages for the earlier portion of the quarter, an upward trend has been evident in the last week. Shipments by water are planned by several producers here just as soon as navigation reopens. A second merchant furnace is scheduled to go into production about the end of the month.

Cincinnati—While shipments of pig iron are being maintained, new orders are chiefly for early needs. Lack of price incentive or delivery problems is a hurdle against contracts for entire second quarter requirements.

St. Louis—Contrary to expectations, shipments of pig iron to date this month are maintaining the rate established in the same period in February. Opinion, however, is general the first quarter of this year represented the peak of deliveries for the present upward movement. Specialty makers, including stoves, heating apparatus, household appliances, farm implements and miscellaneous machinery, account for bulk of iron tonnage.

Birmingham, Ala.—Merchant iron continues to move to melters of the district in small shipments, with an increased tendency toward buying for the second quarter noted. Another blast furnace will be placed in service within two weeks. Price is unchanged at $14.50, base.

Toronto, Ont.—Demand for merchant pig iron is holding at a steady rate. Melters are not placing forward delivery contracts and few are carrying large stocks against future needs. The daily melt, however, is somewhat higher than at the beginning of the year, averaging around 40 per cent.

Scrap

Scrap Prices, Page 59

Pittsburgh — Open-hearth scrap grades declined another 25 cents a ton last week, making the fourth consecutive weekly decline with No. 1 heavy melting steel at $11.75 to $12.25. This figure, however, is nominal in view of apathy of consumers. The only element to strength is brokers' short order coverage, which has been fairly rapid against fear of cancellations.

Boston—Dullness marks demand for scrap, buying for export leading activity. Domestic volume is light, both in New England and outside. For the heavy melting steel grades, $8.75 and $7.75, docks, is paid with district consumers making no effort to follow this price, which is also off 50 to 75 cents from the peak export quotations.

Further weakness has developed in several grades, including heavy cast, forge fire scrap, shafting, skeleton and turnings, the latter having dropped sharply again after prolonged weakness. Malleable is the only grade to display additional strength.

Cleveland—With buyers out of the market and prices largely nominal in absence of trading practically the only activity in steel and iron scrap is in deliveries on contracts. Holders are holding for higher prices. Melters have fairly large stocks on yards.

Chicago—Scrap again is marking time following placing of several thousand tons of heavy melting steel at $10.50. This price was in keeping with the lower market attained a week ago. Mills show no interest in placing extensive orders for scrap, and shipments against contracts are relatively light.

New York—Scrap buying is listless, domestic activity being almost at a standstill with a decline in export bookings. Against contracts dealers are paying less for heavy melting steel, barge, $9 being the top for No. 1 and $7.50 for No. 2. An easy tone prevails on other grades and turnings are again sagging.

Philadelphia — Further softening in scrap prices is noted, with little demand from domestic or foreign buyers. No. 2 heavy melting steel has sagged off 50 cents to $8.50 to $9. For export there has been a reduction of 25 cents a ton, No. 1 now holding at $9.75, wharf, and No. 2 at $8.75.

The leading consumer at Sparrows Point, Md., has recently booked several thousand tons of No. 1 steel at $9.50, delivered, a reduction of 50 cents. This buyer is also still buying a fair tonnage for Bethlehem, Pa., at about $10.

Buffalo—Scrap dealings have been retarded by difference of opinion regarding price. Dealers ask $11.50 with the principal consumer offering $10.50. This has caused a cessation of all large purchases and a nominal market.

Detroit—Except for 25-cent reductions in borings, turnings and mixed borings and short turnings, iron and steel scrap prices are unchanged. They are weak, but apparently have reached the resistance point. Scrap continues to come out in large volume and accumulations in Detroit are extremely heavy. First cargo by water left last week for Lake Erie and water shipments will ease the situation somewhat.

Cincinnati—Dealers' buying prices on iron and steel scrap are unchanged, but the market continues weak. Mills are protected for a few

IN TERMS OF SERVICE

SATISFACTORY Perforated Metal is not just so many pounds of sheet or plate with holes in it. You buy it to do a specific job and should measure the cost by length and degree of service. You have the right to expect and to receive engineering service as well as poundage. With Wickwire Spencer Perforated Metals you get—first, an engineering service to assist in choosing the right specifications for the job to be done; and second, prompt delivery of a perforated product that fulfills your every requirement—however exacting. Our complete production facilities and engineers are at your service. Call on them!

Wickwire Spencer Steel Company, 41 East 42nd Street, New York City; Buffalo, Chicago, Worcester; *Pacific Coast Headquarters:* San Francisco; *Warehouses:* Los Angeles, Seattle, Portland. *Export Sales Department:* New York City.

WICKWIRE SPENCER PERFORATED METALS

weeks, at least, and activity is low.

St. Louis—Weakness continues in scrap iron and steel. The easier tone pervades all grades and extends to sentiment of both buyers and sellers. Dealers report complete inability to interest customers, even where apparent bargains are offered.

Birmingham, Ala.—Scrap dealers report yard stocks sufficient to take care of any demands production in the district might demand. Better steel production pace in March has resulted in added scrap demand. Prices remain unchanged.

Seattle—Local mills have recently been in the market for limited tonnages for which scrap auto material brought $7.50 gross, delivered plant. Dealers' stocks are increasing as supplies are arriving from the country and export shipments are limited. Japan is not buying at present.

Toronto, Ont.—Movement of steel scrap has shown favorable increase but demand is chiefly for heavy melting and there is little call for turnings. Wrought iron and steel axles also are in demand in the Montreal area. Foundries are taking special grades of iron scrap in small lots.

Warehouse

Warehouse Prices, Page 60

Pittsburgh—Local jobbing steel shipments in March fail to show much deviation from the January or February levels. Prices on steel products out of warehouse are without change.

Cleveland—A general slowing in number of orders and tonnage is noted by warehouse interests here, affecting practically all products. This has become more noticeable since the middle of the month. Despite the longer month, tonnage for March is expected to about equal that of February. Usually warehouse business at this time is strongly on the upgrade.

Chicago—Warehouse sales hold at the average of preceding weeks but are heavier than a year ago. While business in the city has been fairly steady, orders from outlying districts exceed those received from local buyers. Prices are unchanged.

Boston—Sales have been below expectations in most lines this month, although showing slight improvement during the last week. Volume is largely of small orders.

New York—Warehouse volume has improved slightly during the last week with indications most jobbers will exceed last month's sales after a sluggish start earlier in March. Somewhat keener competition with foreign steel is met, notably in bars.

Philadelphia—Warehouse business continues light, but within the past few days it has shown some improvement. One leading jobber here asserts that his business is about 15 per cent better than in February.

Detroit—Demand for iron and steel continues to show a slight recession, which is considered a natural letdown in view of the fact that a substantial level of activity was attained in January. If 1936 models are introduced in the early fall, tool and die shop requirements in mid-summer will supply a lift over this usually dull period. Prices are unchanged.

Cincinnati—Steel jobbers continue to book tonnage above recent months and about 20 per cent better than in March, 1934.

St. Louis—Business of iron and and steel warehousemen is steady. Some commodities are moving in increased volume, notably goods for consumption in the farming areas, including fencing wire and accessories.

Seattle—Out of stock items are moving in sustained volume, the active turnover of last month continuing. Sheets, plates and structurals are in best demand. Prices are maintained.

Metallurgical Coke

Coke Prices, Page 57

Accumulation of coking coal in eastern fields in preparation for a threatened mine strike has averted fear of coke shortage.

Sellers of beehive furnace coke on a Connellsville, Pa., oven basis are nominally quoting $3.85 per ton for spot shipment and around $4.60 for foundry grades, but there is still report of unsteady markets. On premium foundry coke, some sellers still claim to be quoting $5.35 per ton, although $5.10 per ton is being done.

Foundry coke shipments in the Chicago district show little change from the February rate. The price for second quarter continues at $8.50, ovens, for outside delivery, and $9.25, delivered, Chicago. Cincinnati consumers are taking large shipments as strike protection but suppliers have stocks for emergencies. St. Louis shipments are at about the February rate and much larger than a year ago. In the Birmingham, Ala., district stocks are increasing as production outruns demand.

Semifinished

Semifinished Prices, Page 57

Engagement of tin plate mills at an average between 85 and 90 per cent of capacity has resulted in one of the heaviest calls for tin bars in

WORTHINGTON

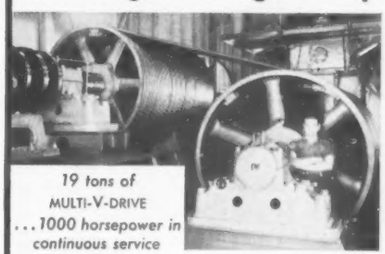
MULTI-V-DRIVE

with

54 GOODYEAR EMERALD CORD BELTS

driven by

Worthington Diesel Engine, Speeds Giant Worthington Centrifugal Dredge Pump



19 tons of MULTI-V-DRIVE ... 1000 horsepower in continuous service

THIS is one of the largest V-belt drives in the world. It demonstrates the practicability of high efficiency Multi-V-Drives on heavy-duty machinery, such as ball, rod and tube mills, heavy saw mill and paper mill machinery, crushers, etc. . . . and on many others of every class where even, maximum power is required.

7 pounds of MULTI-V-DRIVE ... a ¼-horsepower typical unit

From fractional horsepower ratings up, there is a Worthington Multi-V-Drive for every power and purpose.

- Positive Grip
- Permanently Quiet
- Ideal For Close Centers
- Full Efficiency Maintained
- Negligible Maintenance Costs
- Full Performance In Any Position

25,000 stock combinations and unlimited specials

Every drive correctly rated

WORTHINGTON PUMP AND MACHINERY CORPORATION
HARRISON, NEW JERSEY
Offices and Dealers throughout the United States

WORTHINGTON

recent years. This marked improvement, however, has not extended to sheets or strip where nonintegrated mills find they can now obtain deliveries on sheet bars and billets in about a week. Wire rods and skelp are moving in lighter volume. The Pittsburgh base on semifinished steel is steady, with sheet bars, $28 per ton; common wire rods, $38; billets, blooms and slabs, $27. Forging quality carbon billets are $32, and alloy billets, slabs and blooms, $49.

Coke By-Products

Coke By-Product Prices, Page 57

New York—Shipments of coke oven by-products with one exception, phenol, hold to the current high rate, at unchanged prices. Improvement is noted in naphthalene and sulphate of ammonia, as usual at this time. Contract and spot volume is steady, although distributors of toluol and xylol in some instances are unable to take spot business because the lack of material. Recent loss in phenol activity is traceable to slower industrial demand.

Ferroalloys

Ferroalloy Prices, Page 58

New York—Ferromanganese shipments are lagging, due to a recession in steelmaking operations. The outlook for improvement appears mixed, although most sellers anticipate a better movement than now prevails before the first half ends. The market is $85, duty paid, Atlantic and gulf ports. Domestic spiegeleisen, 19 to 21 per cent, is $26, Palmerton, Pa., on lots up to 50 tons, and $24 on 50 tons and over.

Nonferrous Metals

Nonferrous Metal Prices, Page 57

New York—Most nonferrous metals moved in steady markets last week. The sharp drop in tin prices reflected weakness in London while the advance of $1 a ton for lead at the start of the week was due to increased demand.

Copper—Sales continued to maintain an active pace with the March total through Thursday amounting to 22,209 tons. It is likely that the normal monthly book of 30,750 will be exceeded. World copper producers approved a plan for curtailing output abroad and a marketing plan which calls for compilation of stocks, sales commitments and similar data by a joint-committee. Price fixing was omitted. It is understood that conferees are in virtual agreement on export quotas for purely American produced copper with the monthly figure between 7000 and 8000 tons.

Lead—Active consumer buying resulted in a price advance of $1 a ton. Quotations were firm at the higher level of 3.60c, New York, and 3.45c, East St. Louis. St. Joseph Lead continued to ask $1 premium on the eastern market.

Zinc—Prime western market held steady at 3.90c, East St. Louis. Only scattered carlot demand was noted.

Tin—Fair volume of business was done while prices for Straits spot dropped below the 46-cent level. Weakness in the market was directly attributable to declines in the London market and lower sterling exchange rates. Tin plate operations held at about 90 per cent of capacity which augurs well for tin use.

Antimony—Trading was dull with Chinese spot quoted unchanged at 14.50c, duty paid.

Steel in Europe

Foreign Steel Prices, Page 60

London—(*By Radio*)—Exports of steel products from Great Britain in February at 172,941 gross tons, declined 8270 tons from the 181,211 tons exported in January. Imports of steel products in February at 103,306 tons showed an even greater decline, a drop of 27,238 tons from 130,544 tons imported in January.

Import duties on steel products have been officially advanced to an average of 50 per cent, on recommendation of the imports duties advisory committee, in place of the 33 1/3 per cent duties previously in effect.

New business is quiet, but with brighter prospects for the near future. Export business is growing slowly. Sheets, galvanized sheets and tin plate continue in light demand.

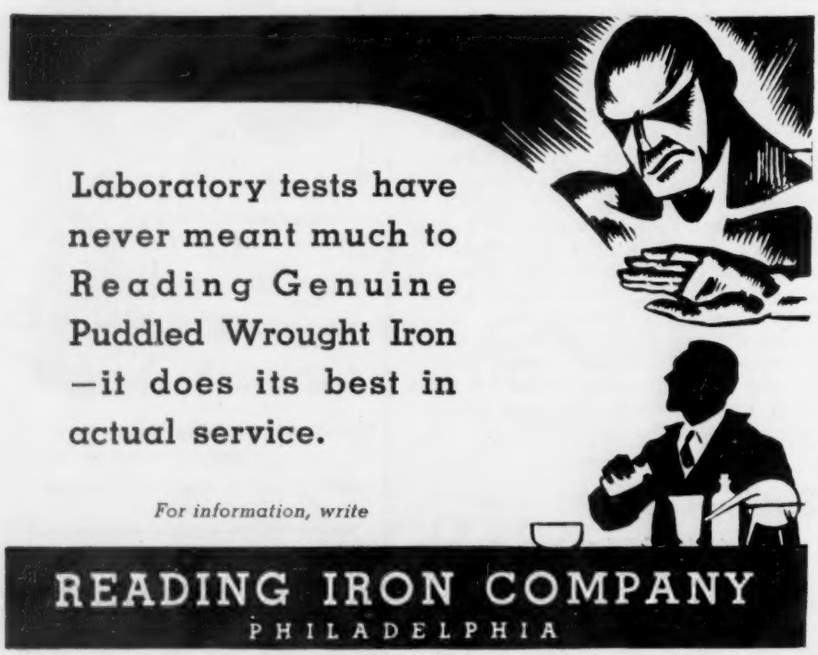
The Continent reports some improvement in export trade.

Institute

AMERICAN Iron and Steel institute, the steel code authority, last week promulgated two sets of resolutions, amendments to three existing resolutions, and an amendment to one set of regulations.

A new resolution defines the place of delivery of plates, shapes and bars, intended for fabrication for oil well derricks, as the railroad freight station nearest the place of assembly or erection. Another resolution starts discounts and periods of freight credit on sales to the government at the date on which delivery is tendered; or, if final inspection and acceptance is at the plant of the seller, at the date on which shipment is delivered to the carrier.

A resolution deals with filing of agency agreements with the code authority, resolution No. A14 relating to agreements between code members and converters is amended. Regulations No. 17 includes federal, state and municipal governments among buyers of oil country goods to whom a re-seller must sell in the aggregate at least 75 per cent of his sales to obtain the right to a deduction.



Laboratory tests have never meant much to Reading Genuine Puddled Wrought Iron —it does its best in actual service.

For information, write

READING IRON COMPANY
PHILADELPHIA

SCIENCE AND INVENTION HAVE NEVER FOUND A SATISFACTORY SUBSTITUTE FOR GENUINE PUDDLED WROUGHT IRON

Died:

JAMES R. GLOYD, 57, construction engineer, expert on water power development and for many years superintendent of construction in the Cleveland district for American Steel & Wire Co., in Cleveland, March 20, after a long illness.

♦ ♦ ♦

Howard D. Simkins, 50, retired factory superintendent of the Superior Screw & Bolt Mfg. Co., Cleveland, in that city, March 19. He retired about a year ago after 12 years as superintendent of the Superior company.

♦ ♦ ♦

Irving N. Haughton, 55, president of the Haughton Elevator & Machine Co., Toledo, O., in that city, March 21. Head of one of the four largest elevator companies in the country, he was also member of the NRA elevator code authority.

♦ ♦ ♦

Arthur J. Hoskin, 66, mining engineer, writer, former editor, professor of mining at the Colorado School of Mines, at one time head of the mining department of the University of Illinois and prior to that mineralogy instructor at Purdue university, in Boulder, Colo., March 13.

(*Other obituary notices, Page 20*)

Equipment

Chicago—Distribution of orders for machinery for the Rock Island, Ill., arsenal is expected to be made shortly. Bids are to be asked soon on machine tools and other equipment for the new diesel-electric locomotive plant to be built near here by the Electro-Motive Corp., General Motors Corp. subsidiary. Several traveling cranes will be required. There is a possibility that orders for some machinery will be placed at Cleveland. Machine tool demand here recently has been more active, as have inquiries, following a lapse in buying the preceding several weeks.

Pittsburgh—An early award is expected to be made on two large continuous strip mills. One is for the American Sheet & Tin Plate Co.'s Gary, Ind., works, and the other for the Great Lakes Steel Corp. division of National Steel Corp. at Detroit. Award of these contracts likely will complete, at least for the time being, work of this nature among leading steel producers, despite the fact that several other producers are considering the installation of continuous sheet mills.

New York—Machinery sales volume, limited to one or two units per order, is holding well, gains of the last two months being retained. Orders placed against inquiry which came out a year or more ago are being closed frequently by some of the larger representative industries. First contracts for nearly 200 tools for the government, mostly arsenal equipment, are expected to be closed within a week.

Seattle—Demand for miscellaneous items, such as drills, electrical equipment, power hammers, shovels and other machinery used in mining is active, with opening of the Alaska seaon. Oregon highway department will open bids March 26 for road machinery.

Boston—Operations at machinery building plants are holding on old business with an increase in orders experienced by some shops. These gains have been made exclusive of government orders which will be heavier within the next week or 10 days, when considerable arsenal shop equipment is to be placed. Grinding machine builders in the Worcester district are fairly active. Brown & Sharpe Mfg. Co., Providence, R. I., is low on two milling machines included in the Philadelphia navy yard list which closed March 4, while the Norton Co., Worcester, Mass., is low on one of three grinders.

Construction and Enterprise

New York

BROOKLYN, N. Y.—Hindale Structural Steel Corp. has been incorporated to operate a foundry and machine shop, by Bernard Cohen, Albert Krull, 160-16 Jamaica avenue, Jamaica, N. Y., and Florence Sloben. Papers were filed by Jack J. Kaese, 15 Park Row, New York.

GENEVA, N. Y.—Plant of the Geneva Foundry Corp. recently sustained severe damages by fire. Arrangements are being made to transfer operations to the plant of the Summit Foundry Co. here, pending rebuilding.

NEW YORK—United Carbon Co., 350 Fifth avenue, has acquired properties in the Monroe and Richland oil and gas fields in Louisiana and plans additions and extensions to the carbon black plants and natural gas developments. Estimated cost will exceed $100,000.

NEW YORK—R. J. Scott & Co., 90 Broad street, has acquired a plant and a 5-acre tract of land at Middlesex avenue and Lehigh Valley railroad, Metuchen, N. J., and will alter and recondition the factory for its own use. Cost will exceed $28,000.

NEW YORK—Tri-Boro Steel Supply Co. Inc., has been incorporated to deal in metal netting, springs, and rods, by Thomas J. Flanagan, 7920 Ridge boulevard, Brooklyn, N. Y.; Bernard A. Gunn, 2 Pinehurst avenue, New York; and Herman C. Dornheim, 133 Lincoln avenue, Bronx, N. Y. Papers were filed by Mudge, Stern, Williams & Tucker, 20 Pine street, New York.

NEW YORK—Raisler Heating Co., 129 Amsterdam avenue, at $313,700 is low on the contract for the air-conditioning of the United States treasury building, Washington, the project requiring substantial volume of steel sheets, piping, pumps and miscellaneous metals.

ROCHESTER, N. Y.—Snider Packing Corp. plans an addition to its can-

FOUNDED WATERBURY FARREL 1851

84 YEARS
EXPERIENCE IN BUILDING
AUXILIARY EQUIPMENT
FOR
SHEET, TUBE, & ROD MILLS

is at your service to aid you
in modernizing your plant.
Let us have your problems.

The Waterbury Farrel Foundry
and Machine Company
Waterbury, Connecticut, U. S. A.

OFFICES
CLEVELAND CHICAGO PHILADELPHIA

ning plant at Mount Morris, N. Y., to cost $150,000 with equipment, the latter to include cold storage and freezing installations.

STATEN ISLAND, N. Y.—Superintendent of lighthouses, will take bids March 27, proposal 48226, for one 200-horsepower diesel propelling engine, two auxiliary high-pressure electric motor-driven compressors, two 30-horsepower vertical diesel engine-driven air compressors and two 7½-kilowatt oil engine-driven d.c. generators.

New England

HARTFORD, CONN.—Trinity college will soon award contract for construction of a 3-story chemical laboratory. Estimated cost $400,000.

BRIDGEPORT, CONN.—A. P. Thorne, secretary, FERA planning board, plans secondary disposal treatment plant and filtration beds at the Bostwick avenue plant, costing about $480,000. F. Toquet, city hall, engineer.

New Jersey

DOVER, N. J.—Dover Tank & Stack Co., recently formed, has leased the plant of the International High Speed Steel Co. where it will manufacture tanks, stacks, smoke flues and a general line of steel plate and steel shape construction. It will also specialize in electric and acetylene welding and boiler repairs.

Pennsylvania

CONNELLSVILLE, PA.—Interstate Amiesite Co. Inc., Wilmington, Del., is beginning work on a plant here for production of amiesite and rock and asphalt products. Total expenditure is expected to involve about $60,000.

JOHNSTOWN, PA.—Atlantic Coal & Coke Co., Johnstown, Pa., was recently granted a state charter with $5000 capital to mine and prepare coal, coke and other fuels. R. P. Reed, A. M. Buckhart and V. Williams, Johnstown, Pa., are principal incorporators.

Ohio

CLEVELAND—Thompson Products Inc., 2196 Clarkwood road, is considering entering the manufacture of electric kitchen stoves, possibly at its Detroit branch.

PIQUA, O.—Favorite Mfg. Co. has been organized by W. C. Katker to take over the repair part patterns for all Favorite gas ranges, coal heaters, coal stoves and warm air furnaces from the Favorite Stove & Range Co., Piqua, which has been liquidated. The company also will manufacture cook and heater type stoves and warm air furnaces.

Michigan

BATTLE CREEK, MICH.—Oliver Farm Equipment Co. is making a survey to determine the possibilities of moving back to Battle Creek the foundry which was moved to South Bend soon after the merger of the Nichols & Shepard Co. to form a unit of the Oliver company in 1930.

DEARBORN, MICH.—Ford Motor Co. is making preparations to install new glass manufacturing equipment in its glass factory at the Rouge plant. The new unit will consist of two 600-foot lines, including melting furnaces, annealing furnaces, grinding and polishing machines, capable of producing 90-inch wide ribbons of one-eighth inch plate glass at the rate of 150,000 square feet every 24 hours. Approximate cost of the project is $3,000,000.

DETROIT—Bundy Tubing Co., 10951 Hern avenue, is constructing an addition to its factory building.

DETROIT—Lincoln Motor Co., 6200 West Warren street, is having plans prepared for alterations to its plant.

DETROIT—Myco Mfg. Co. has been incorporated with $50,000 capital to deal in machinery and tools, by Herbert M. Meyer, 1120-23 Buhl building.

DETROIT—Dawes Mfg. Co. has been formed to deal in propulsion motors, by Bailey P. Dawes, Ryan road at Nevada street.

DETROIT—Buell Die & Machine Co. has been incorporated to deal in tools and dies by Charles H. Buell, 3535 Scotten avenue.

DETROIT—Walway Co., 35 Fairview station has been incorporated to fabricate metal stampings, by Eldon Hemmingway, 15500 Piedmont avenue.

DETROIT—G. & H. Governor Co., 14812 Grand River avenue, has been incorporated to engage in production of devices, by Harry Mann, 11364 Cascade avenue.

DETROIT—Department of public works, city hall, contemplates the installation of three new stokers and other improvements at the Fairview pumping station. Estimated cost $18,000.

GRAND RAPIDS, MICH.—Joppis Dairy Co. is planning to erect a 2-story dairy building.

HAMTRAMCK, MICH.—Dalzen Tool & Mfg. Co., 2421 Smith street, has been incorporated with $15,000 capital to deal in dies and tools, by Peter Collins, 12735 Corbett avenue.

MONTROSE, MICH.—Village is having plans prepared by Francis Engineering Co., Saginaw, Mich., for a $40,000 water system.

MUSKEGON, MICH.—White Star Refining division of the Socony-Vacuum Oil Co. Inc., 26 Broadway, New York, has purchased a 14-acre site in Norton township here for the erection of a bulk storage tank plant and combined water and rail terminal. The bulk plant will include two 92,000-barrel tanks, two 59,000-barrel tanks and one 7500-barrel tank. The project will cost about $125,000.

PORT HURON, MICH.—City is considering the purchase of a 15,000,000-gallon per day turbine driven pump.

Indiana

ELKHART, IND. — Elkhart Iron Works recently sustained slight damages by fire.

TERRE HAUTE, IND.—Commercial Solvents Co., 629 Cherry street, plans to construct an addition to its distilling plant at an estimated cost of $29,000.

Illinois

CHICAGO—Carson, Pirie, Scott & Co., State & Madison streets, will make improvements to its retail department store costing $1,250,000 to $1,500,000. Work will include installation of two banks of escalators, 16 new elevators, new heating and power plant, and equipment for partial air conditioning of the store.

CHICAGO — Electro-Motive Corp., subsidiary of the General Motors Corp., General Motors building, Detroit, has acquired a 70-acre site at McCook, near LaGrange, Ill., for erection of a plant for the manufacture of diesel-electric railroad locomotives. The plant will consist of nine buildings, including an erecting and machine shop building, a 3-story office building complete with air conditioning system, blacksmith shop, annealing ovens, and blast building, paint shop, warehouse and power plant. The erecting shop will require one 200-ton crane and two 30-ton cranes, while two 20-ton cranes serve the machine shop. Austin Co., Cleveland, is the general contractor. (Noted Feb. 18).

EAST ST. LOUIS, ILL.—Board of trustees of the east side levee and sanitary district will receive bids until April 12 on five pumps and engines and auxiliary equipment for the Winter avenue pumping station. Estimated cost of equipment is about $275,000.

Alabama

BIRMINGHAM, ALA.—Birmingham Stove & Range Co., Tennessee Pike, has permit for erection of enameling plant here, at an estimated cost of $5000.

CHILDERSBURG, ALA.—City, M. L. Kidd mayor, will soon call for bids for 100,000-gallon steel tank and tower, 6-inch deep well, pump house. PWA loan of $39,000 has been allotted.

District of Columbia

WASHINGTON — Commissioners, room 427, District building, will take bids April 9, for constructing a sewage pumping station, grit chambers and raw sewage meter for a sewage treatment plant at Blue Plains, D. C.

WASHINGTON—Chief of ordnance, United States army, will receive bids April 8, circular 31, for one 13-horsepower and one 5-horsepower electric motor, three individual motor drive attachments, one electric moulder and one gas-fired forage and oven furnace.

Florida

BUSHNELL, FLA.—Florida Moss Ginning Co. Inc., O. H. Wenzel, North Main and Belt street, is rebuilding its plant, and will install conveyors, electric motors, power generating equipment and steel pulleys.

WEST PALM BEACH, FLA.—Whitting Machine Works Inc. has been incorporated by G. S. Whitting, 4 Tanglewood court, and L. B. Whitting.

Georgia

GLENNVILLE, GA.—J. N. DeCecco, Vienna, Md., is erecting a canning plant here, to cost about $15,000.

Kentucky

FRANKFORT, KY.—Kennebec Distillery Co. is having plans prepared by C. J. Kiefer, architect and engineer, Schmidt building, Cincinnati, for a distillery. Estimated cost $100,000.

Maryland

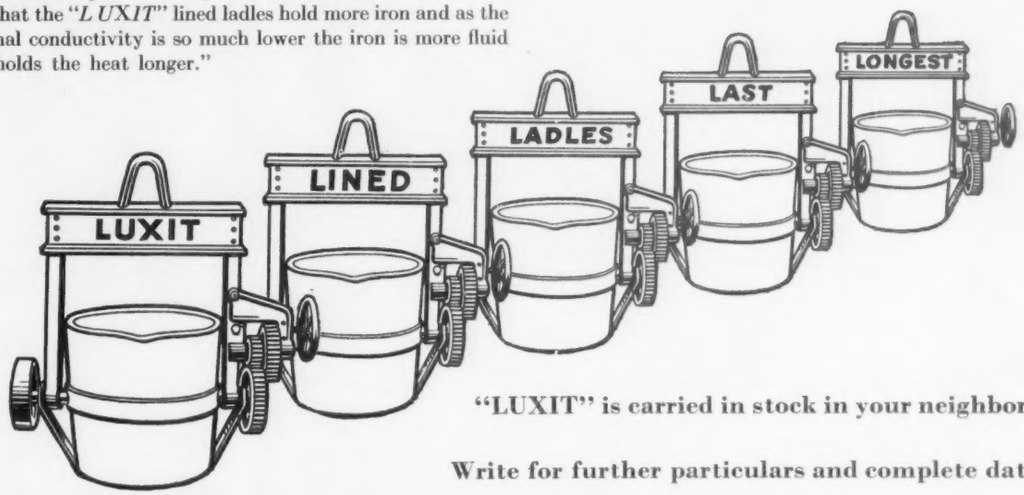
BALTIMORE—City, bureau of mechanical electrical service, Municipal building, may expend $1,500,000 for electric conduit system extensions.

BALTIMORE—Purchasing and contractor officer, Holabird Q. M. depot, will open bids April 8, circular 118, on 100 items of hand and machine tools, including drills, abrasive wheels, auto creepers, jacks, gages, wrenches, electric grinders, etc.

WESTMINSTER, MD. — Sherwood

Use "LUXIT"—*The Monolithic Lining On Ladles*

One of our customers says about "LUXIT":—"Daily heat 130 tons. Ladles formerly lined with clay and fire sand mixture two inches thick and lined daily. Now lined with "*LUXIT*" ¾ inch thick and run six to ten weeks without relining. This firm required 13 men pushing ladles around the shop. Now only 11 men are required due to the fact that the "*LUXIT*" lined ladles hold more iron and as the thermal conductivity is so much lower the iron is more fluid and holds the heat longer."



"LUXIT" is carried in stock in your neighborhood.

Write for further particulars and complete data to—

The Alpha-Lux Co., Inc. 192 Front Street New York City

HOLCROFT & COMPANY

LEADERS IN BUILDING AND DESIGNING ELECTRIC AND COMBUSTION FURNACES, KILNS AND OVENS.
HOME OFFICE: DETROIT—BRANCHES: CHICAGO, PHILADELPHIA
CANADA: WALKER METAL PRODUCTS, LTD., WALKERVILLE, ONT.

BUILT BY HOLCROFT & COMPANY DETROIT-MICH.

JIGS — FIXTURES — SPECIAL MACHINES— PUNCHES—DIES—*"to your measure"!*

Let our trained engineers apply our 28 years' experience to your equipment problem. Our successes in other plants of all types, and proved methods assure a solution of any question involving production machinery. Write us in detail without obligation.

THE COLUMBUS DIE, TOOL AND MACHINE CO.
COLUMBUS, OHIO

Moore Rapid LECTROMELT Furnaces

Standard Sizes 25 lbs. to 100 Tons Capacity
Most Rapid and efficient for making
Tool Steels, Alloy Steels, Forging Steels
Steel Castings, Malleable Iron, Grey Iron, Carbide, Ferro-Alloys etc.
PITTSBURGH LECTROMELT FURNACE CORP.
P.O. Box 1257, FOOT OF 32ND ST. PITTSBURGH, PA. U.S.A.

PERIN ENGINEERING CO., Inc.

CONSULTING ENGINEERS

Investigations, Reports, Development of Raw Materials, Ore Sintering, Coke Ovens, Blast Furnaces, Open Hearth and Electric Steel Plants, Rolling Mills, Power Plants, Cement Plants

535 Fifth Ave. NEW YORK
Cable Address PERINESTEP

Simonds Cut Gears

SPUR—BEVEL—MITRE & WORM—RACK
CUT TEETH—SPECIAL MACHINERY . .

Treated gears—cut and finished by Simonds—last longer, eliminate costly shut downs and work smoother and more efficiently.

Made in all sizes for any service and TREATED to meet your requirements.

Also—
Ramsey Silent Chain Drives : Gates
Vulco Rope Drives : All Steel Silent
Pinions : Bakelite Silent Pinions

The SIMONDS MANUFACTURING Co.
25th STREET — PITTSBURGH, PA.

Distilling & Distributing Co., 212 East Lombard street, Baltimore, is contemplating erecting a plant here.

Mississippi

KOSCIUSKO, MISS.—City, J. S. Boswell mayor, will receive bids April 2 for furnishing and installing motor-driven deep well turbine pump, complete with all necessary parts.

North Carolina

LENOIR, N. C.—Barger-Ashe Roofing Co. has been incorporated with $20,000 capital to operate a metalworking plant, by Ray C. Barger and J. B. Ashe.

NEW BERN, N. C.—Neuse Veneer & Box Co., Bonner H. Thompson president, Wilmington, N. C., is planning to make improvements to its plant.

Tennessee

JOHNSON CITY, TENN.—City, Ben B. Snipes mayor, is considering applying to PWA for $700,000 to finance power distribution system for TVA power.

LAFOLLETTE, TENN.—City is planning complete new water system costing about $175,000. Freeland, Roberts & Co., consulting engineer, Nashville, Tenn.

NASHVILLE, TENN.—Smith Packing Co., R. E. Smith president, has been organized to succeed Smith-Crittenden & Co., 530 Third street, North, and will erect a 1-story building to cost about $40,000.

West Virginia

CHARLESTON, W. VA.—Union Carbide & Carbon Corp., 30 East Forty-second street, New York, plans expanding its plant here, and is making a study of the advisability of enlarging the electric furnace at Alloy, W. Va. Its 1935 program calls for expenditure of $15,770,000 for construction and expansion of new properties.

Virginia

MADISON HEIGHTS, VA.—City has loan and grant of $88,500 for installing water distribution system. Elmer E. Barnard, consulting engineer.

Missouri

ELVINS, MO.—City is considering construction of sanitary sewer and disposal plant. Russell & Axon, engineers, 4903 Delmar boulevard, St. Louis.

Arkansas

HARRISON, ARK.—City, Rex Worthington mayor, will vote April 9 on $130,000 bonds for light plant and distributing system.

PORTLAND, ARK.—City will take bids about April 1 for $32,000 waterworks, including tank and tower. Hugh R. Carter, engineer, National Standard building, Little Rock, Ark.

Oklahoma

FREDERICK, OKLA.—City has had erection of diesel engine power plant approved by PWA costing $125,000, and will hold a bond election in April. V. V. Long & Co., Colcord building, Oklahoma City, Okla., engineer.

HOMINY, OKLA.—City plans light plant and distribution system. V. V. Long & Co., engineer, Colcord building, Oklahoma City, Okla.

Texas

CORPUS CHRISTI, TEX.—Morris Stern, Majestic building, San Antonio, Tex., is planning to erect a cold storage plant at Chaparral street, which will include a dry and vapor system. Estimated cost $70,000. John J. Runck, Corpus Christi, Tex., representative.

DALLAS, TEX.—Cox Steel & Wire Co. Inc. has been incorporated with $60,000 capital stock to deal in iron and steel, by W. T. Cox, E. F. Langham and H. W. Davis.

DALLAS, TEX.—Forney Engineering Co. has been incorporated with capital stock of $20,000 to deal in iron and steel, by H. H. Forney, Kathryn Forney and Henry Fletcher Yeargan.

PORT ARTHUR, TEX.—Texas Co., 135 East Forty-second street, New York, is contemplating a $3,000,000 expansion program at its refinery here. Fred P. Dodge is general superintendent of company here.

Wisconsin

MADISON, WIS.—Oscar Mayer & Co., 1241 North Sedgwick street, Chicago, meat packer, has let contracts for a 5-story addition, 40 x 80 feet, to the beef cooler building at its local plant on North street.

MILWAUKEE — Allis-Chalmers Mfg. Co. has booked government contract for furnishing three 15,000-horsepower vertical water wheel generators for Loup river public power district development at Columbus, Nebr.

NEENAH, WIS.—School Stationers Corp. has started work on a 1-story addition, 62 x 120 feet, to its plant in Menasha, Wis. Harry Williams is president and manager.

SHAWANO, WIS.—Municipal water and electric commission, Blain Page superintendent, will be ready for bids about April 11 for general alterations to power house, and building 2-story addition, 52 x 110 feet, to include city garage and fire station.

Colorado

BOULDER, COLO.—Cross Mining Co. is completing a three-year program of development of its property in the Caribou district, under the direction of George H. Teal. A sufficient reserve of ore now makes it possible to erect a mill at the mine.

Wyoming

CASPER, WYO.—Wyoming Distilling Co., care of J. E. Scott, is having plans prepared for construction of a distillery. Estimated cost $150,000.

Pacific Coast

DINUBA, CALIF.—Alta Winery & Distillery is spending $25,000 for additions and new equipment at its plant south of Sultana, near here.

HUNTINGTON BEACH, CALIF.—American Beet Sugar Co. will build a new sugar manufacturing plant here. Negotiations for a site are going forward.

LOS ANGELES—Griffith Co., 2555 East Ninth street, has applied for a building permit to construct an addition to the shop building.

LOS ANGELES—William P. Neil Co., 4814 Loma Vista street, will build an addition to the factory at 4371 East Forty-ninth street for the Central Manufacturing District. Cost is estimated at $10,000.

LOS ANGELES—California Walnut Growers' association is erecting a large warehouse on Fruitland avenue, near Pacific avenue, at a cost of approximately $400,000. The structure will be 420 x 700 feet and will have fireproof walls and steel columns.

SAN FRANCISCO—H. M. Schick Products Co., Third and Clementina streets, plans construction of an industrial shop building.

SAN FRANCISCO—Associated Oil Co., 79 New Montgomery street, announces it will expend $750,000 during 1935 for erection of new service stations, $6,300,000 for development in Ventura and San Joaquin oil fields, $523,000 for transportation improvements and $575,000 for refinery improvements.

SAN GABRIEL, CALIF.—Golden West Brewery Co., Seventh and Kirkham streets, Oakland, Calif., has purchased a site at Santa Anita street for erection of a brewing plant.

STOCKTON, CALIF.—Pacific Can Co., 290 Division street, San Francisco, will ask for bids for construction of a cannery here to cost about $50,000.

STOCKTON, CALIF.—Oakland Packing Corp., G. G. Hurt president, will spend $150,000 for alterations to packing plant, including installation of new machinery and equipment. Lawrence waters, Sutter hotel, manager of construction.

TORRANCE, CALIF.—Chanslor Canfield Midway Oil Co. is constructing a $10,000 machine shop building here.

MARSHFIELD, OREG.—L. A. Martinez, San Francisco, has purchased the Evans Products Mill and after repairs and installation of new equipment, will operate it to produce cedar lumber and products.

PORTLAND, OREG.—Contract for a 1-story concrete factory and office, 71 x 100 feet for the L. R. Teeple Co., 2808 Southeast Ninth avenue, has been awarded by Architect F. Marion Stokes.

PORTLAND, OREG.—W. P. Fuller & Co. is spending $20,000 remodeling its paint and varnish factory and plant at Northwest Twenty-second avenue and Nicolai street, including installation of new equipment.

BREWSTER, WASH.—City will open bids April 1 for construction of a 50,000-gallon reservoir addition, and reinforced concrete pump house.

SEATTLE—Rainier Brewing Co., 1550 Bryant street, San Francisco, announces it will reopen its local plant June 1 on a 150,000-barrel annual capacity. Plans call for installation of considerable new equipment, including two large kettles.

SPOKANE—Wyoco Oil & Gas Co., 502 Columbia building, has been organized by W. S. Gilbert and associates, with capital of $25,000.

WALLA WALLA, WASH.—Walla Walla Canning Co. is constructing an addition to its local plant, requiring additional equipment.

Dominion of Canada

BRIDGETOWN, N. S.—Annapolis Basin Pulp & Power Co. Ltd., K. L. Crowell manager, plans the construction of a pulp mill, and electrical power development at Paradise lake.

HAMILTON, ONT.—Dominion Foundries & Steel Ltd. is having one of its buildings reconstructed prior to installation of a tin plate mill.